

(1?)
February 21, 1964
Above Jaruma

Afternoon. Working in area above Jaruma where I saw several behaviors among Bruns and lots of singing by CC's. Arrive 3:40. Overcast. Cold. Windy.

Lots of midians around!

No red tubular flowers here now.

Brun

3:50. See single Brun. Flying quite rapidly from bush to bush in thick scrub along edge bare crop field. Definitely being followed and joined by small brown bird (Jernardiel? House Wren?). See at least 3 separate examples of joining. As far as I can tell, the Brun is capturing its attendant.

4:05. See a single through alone. Dull gray brown. Moderately dark. Yellow-bell. Yellow-orange legs. No bright eye-ring.

Brun

4:30. See a single Brun. Alone & silent. Feeding on pink geraniums. (It must be hard up!)

There are really quite a lot of birds around here now. But they are staying under cover and are very difficult to identify.

CC A single CC flitting. Alone. Uttering thin high "freet" notes.

This bird was really very blue-gray underneath.

See 2 Orange-billed Saltators in scrub. Probably essentially alone — altho there were also some Andean Sparrows in the same or nearby bushes.

4:45. See another single through alone. Almost certainly the same species (but not the same individual) seen earlier. But this time I notice that the bird has a definitely light forehead (but not quite white, and intergrading with the darker color of the rest of the head).

(9)

See still a third single thrush alone. Again almost certainly same species. Forehead light, altho far from white (possibly forehead slightly streaked).

5:15. See 2 more thrushes alone.

Still more single thrushes, and pairs, alone. All at distance. Apparently all same species.

See a single wren alone. Apparently House Wren.

5:22. Starting to rain.

See a pair of wrens. Apparently alone. Rapping & singing.

5:34. Hear a brief burst of what sounds like C song. Half "mini-twitter", half obvious triplet. Typical phrase probably "Ta-a-zee ta-a-zee ta-a-zee ta-a-zee".

Last 2 trisyllables quite clear and distinct. First 2 uttered so rapidly as to be almost indistinguishable. Songs coming from Eucalypt where C sang on previous trip.

Leaving 5:50 p.m., as rain getting stronger.

It certainly doesn't look as if anything is breeding here now.

February 2, 1964
Below Palca

Going to work at relatively low altitude - almost the lowest place I visited on the last trip - where I saw the *Thlypopsis*. Along edge of river. Arrive 5:30 a.m. Clear. Just beginning to get light. I think I can hear a few birds (over the roar of the stream) in the distance, but can't identify them.

Quite a large number of birds singing before 5:45 a.m. Many

of them sound like thrushes.

NOTE: There seems to have been a big landslide right where I saw the *Thlypopsis* most frequently during my last visit.

5:52. Getting light enough to see a little

This whole area (unlike the area above Jarua where I worked yesterday afternoon) looks somewhat drier than during my last visit.

5:54. Hear what maybe Brun song. Without R component.

Area of thick but rather dry looking scrub.

6:04. See a single Thrush alone. Apparently same species as yesterday.

"Dawn Chorus" almost stopped 6:08 am

Very dull 6:20 am

6:27. See a single C alone

See a single House Wren alone

Few or no tubular pink or red flowers around now

6:35. See single *Thlypopsis* alone. In low dense bamboo thicket.

Uttering occasional "Tut" Note. Picks up long leaf or blade of grass. Apparently new ?! ?! Apparently same species seen in this region before (XXXIII) but looked almost clear gray above, almost whitish lower breast and abdomen.

See the same bird or another individual same species nearby area only a few minutes later. Now see that it is slightly brownish below (definitely XXXIII)

6:50. Again see *Thlypopsis* same area. Again alone

Incidentally, this *Thlypopsis* is only about 50 yards from where the

C was seen earlier

7:12. See a single Orange-bellied Saltator alone

Brun

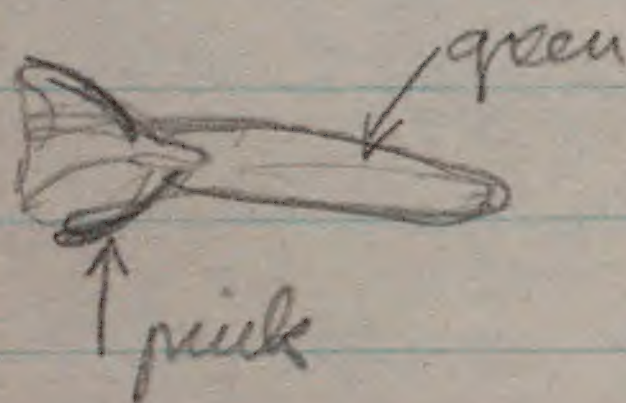
7:30. See a single Brun. Alone. Feeding on insects from leaves small bushes low dry scrub. (This is not far from where the *Thlypopsis* was seen earlier — on the opposite side, of the *Thlypopsis*, from the C.)

7:46. See another single through. Alone. Definitely same species seen yesterday above Jaruma

8:04. See a single House Wren and a single Andean Sparrow in same bush. Apparently ignoring one another.

Brun

8:07. See a single Brun (not same individual as before). Feeding on pink trumpet-shaped flowers which seem to be the same species favored by *diglossines* all over the Andes



This Brun is apparently alone, except for several hummingbirds

IV of different species within distance of 10-20 yards. Several *Patagona* gigas. Also one blackish hummingbird with white thighs (probably *plumbeus*), no IV on the hummingbird list. No obvious reaction between the Brun and any of the hummingbirds. But the Brun flies on almost immediately and then the IV hummingbird visits all the trumpet-shaped flowers where the Brun had fed and sticks its bill in the holes made by the Brun!!

8:14. See another House Wren alone.

CC

Brun

CC

See a pair of CC's alone. Feeding in low open scrub. Apparently getting insects. (These birds also looked very blue gray).

A few minutes later see a single Brun about 20 yards from where the CC's had been (the CC's are no longer visible)

Some distance further on, see a single House Wren singing alone.

8:37. See a single through alone. This seems to be same species as

(one of) the Quetzal species. Sooty. Coral bill & legs. Yellow-orange eye ring.
A little further on, see a pair of the "light-capped" Thrushes. Also
me.

Brunn
IV A

Brunn
IV
IV A

Brunn
IV A

Brunn
IV A

Brunn
IV A

8:50. Further on, come across another single Brunn. Apparently
feeding insects on leaves small bush open scrub near small stream. For min-
utes on end, a single hummingbird hovers and darts all around the Brunn.
Repeatedly coming within 1-2 ft of the Brunn. This hummingbird probably no.
IV, but looks slightly different from previous IV seen. Call it IV A. (See
description in list.) Most of the time the Brunn ignores the hummer. But three
times (at least) the Brunn breaks off feeding to fly at the hummer and drive
it a few feet away. Attacks are silent. Eventually the 2 birds separate.

Is hummingbird IV (and IV A) parasitic on Brunn ???

8:57. See pair of Melospiza XXXIII feeding together in thick low-
scrub. Utter several long R's while moving about together. R's are loud,
sometimes slightly fluctuating. Possibly higher and thinner than those of refi-
caps in Bolivia.

NOTE: Both the Brunn and the hummingbird involved in the Acetate in-
cident described immediately above were not the individuals involved in the
Brunn-hummer incident seen earlier this morning.

9:12 a.m. See single Melospiza XXXIII alone. Possibly one of pair seen
earlier.

Then see single Brunn alone.

Leaving 9:25

With the dubious exception of the Melospiza, everything here seems
to be in complete non-reproductive mood!

NOTE: The area where I saw the last encounter between a Brunn
and a hummer was 8700 ft according to my altimeter (which may be a litt

6 high)

This afternoon going to walk up to A Pect area. Arrive bottom path
2:50 p.m.

✓
See pair of *Melospiza* alone near highway.

Then see single "Light-capped" Thrush alone.

Then another, quite high (almost at upper path), 10,050 ft.

Reach lower patch humid scrub just below A Pect area 3:48. It is
now cloudy and very windy. No birds visible at moment.

Arrive main badly hummed thicket 4:04 p.m.

See single *Turdus* alone. Sitting 20 ft up in tree, exposed, but silent.

Hear a few phrases of what sound like *Bum* song uphill. Twittering.

4:27. Everything very quiet - except for some *Bum*-tailed Pigeons
which may be courting.

Bum
4:31. See single *Bum* alone. Utters "Zueeuee zaza za" as it lands,
after flying away from me.

4:35 p.m. Reach precise A Pect area. No sign of either A or B Pects.
(There has been a little bit of humming & cutting around here.) According to
my altimeter now, it is 10,700 ft.

See a single *Turdus* alone. And another (or the same bird again)

Then see a single *Bum* feeding off leaves.

Then hear burst of what may be Pect song downhill.

Everything very quiet 4:52 p.m.

5:00. See single *Bum* alone again. Probably same individual as be-
fore.

Then see another single *Bum* alone. In one of the areas where B Pect
was seen last time.

Then hear burst of song which may be Pect in distance.

Bum
Pect?

Bum

Bum
Pect?

Then see single thrush alone. Apparently Quito species without eye-ring.
Then see another single thrush alone. Apparently Quito species with eye-ring!

Brown

5:17. See another Flycatcher alone.

Then see another Brown alone. Again.

Fog coming in 5:25 p.m.

See the same or another Flycatcher alone again. Again.

Now see a pair of Flycatchers together. No other species nearby. Again.

Starting down hill 5:42, as fog is getting thicker.

GENERAL COMMENT: It seems obvious that mixed flocks of finches, tanagers, honeycreepers, and warblers are absent here - just as in the Quito region.

There seems to be a positive correlation between non-gregariousness and paucity of species. I.E. when there are few species in a given area, there are few or no mixed flocks. Is this correlation direct or indirect. Are there no mixed flocks because there are few species? Or are there few species and no mixed flocks because of some other factor in the environment or because of the history of the area.

Offhand, one would expect the central part of the Andes to have more species than the periphery. The fact that this is not the case must, I think, be because the central species, and central populations of widespread species, are more efficient competitors (and have relatively wider ecological niches) than the peripheral populations and species. After all, the central populations and species presumably have had more time, on the average, to become efficient competitors.

One might suppose, to put it crudely, that the longer a fauna has remained in an essentially stable environment the fewer species it will

contain!

In any case, it seems likely that the different degrees of gregariousness exhibited by central and peripheral populations are due not only to the advantages of gregariousness to peripheral populations but also to the disadvantages of gregariousness to the extremely competitive central populations. Possibly central species do not exhibit intra-specific gregariousness simply in order to avoid stimulating inter-specific gregariousness.

One might suppose that when two related species come together — if one does not exterminate the other — first there will be strong selection to reduce competition between the two species and permit them to coexist together in relatively large numbers — but then one of the species will succeed in evolving some generally superior "progressive" adaptation and will replace the other eventually.

February 3, 1964
Below Palca

Going to work where I saw last Brown-hummer interactions yesterday morning. (I understand that this place is called "Valdeira").

Brown (late) 6:28 a.m. Overcast. Warm

See single Brown alone.

See single House Wren alone.

See a pair of "Light capped" Hummers alone.

6:41. Well! Well! Well! See a single Basileuterus-type.

Alone. Got a very good view of it, and should be able to identify it later.

Quite small (i.e. almost certainly Basileuterus, not Heuripingus). Body olive

above, yellow below. Head striped. Crown largely olive, black or blackish in front. Prominent yellow supercilium. Dark streak thru eye. The crown was much less black than that of the B. nigrocapitata near Quito (or that of the Peruvian nigrocapitata I saw in the museum in Lima), but apparently somewhat darker in front than the B. luteoviridis I saw in the museum. But I rather think that it must have been the latter. Probably not a juvenile because uttering lots of R's. R's rounded different from the one of nigrocapitata near Quito (and probably Andean). Thinner and weaker, uttered with varying speeds. This bird was in thin hedge of low scrub along edge cultivated field.

Brown

See single Brown alone.

See single House Wren alone.

6:58. See some Basilanthus again. In similar hedge. Still alone.

Crown in general looks same color as back. Still uttering relatively soft R's.

See a single Myiophobus XXXIII alone.

See another single House Wren.

IV 7:13 a.m. See what appears to be no. IV hummingbird or something similar. Feeding alone. This time I see that it has white spot behind eye. Presumably Metallura phoebe.

7:40. Have gone up ravine along small stream. Lots of nice scrub that looks as if it should be full of my birds but does, in fact, seem to be deserted. Why? Too wet.

Go on down stream again.

See single House Wren alone.

IV? IV A?

Then see single Hummingbird perched alone & quiet. Definitely IV or

IV A. Does not have white patch behind eye.

7:55. Starting to rain.

II or IVA
Brun

That what sounds like local Freckle song in distance up hill
II or IVA hummer flies off after another dark bird, which is, I think, a Brun. Then the presumed Brun disappears, and the hummer goes off to feed by itself. (There may be the same 2 birds involved in the hostile encounter yesterday.)

8:30. See a pair of CC's feeding alone. Utters twitters as "greetings".
See a pair of light capped Thrushes alone. Joined by a third. One of the pair immediately chases newcomer. I.E. this species is not at all gregarious now.

See same pair of CC's again a few minutes later. Still alone. Silent. Probing at leaves, apparently for insects.

Then see a single CC alone. Utters twitter as "landing call".

8:45. See single II hummingbird. Perched alone. Get excellent view of it. See white plumes thigh, w/feathers underneath to tail. Obvious, now, that II and IVA are the same thing. This bird had little or no white spot behind eye. The bill of this species is straight, moderate in length, and somewhat awl-shaped.

Brun

A few minutes later see single Brun feeding alone.

Leave 9:30. Rain getting stronger.

NOTE: According to my driver, the rainy season here should be from December to March. But this year it is "delayed" — i.e. there has been less rain than usual so far.

This afternoon going to work on lower slopes of Cutacaulco (starting out from high way at same place where one starts for Peet area. Arrive 3:35 p.m. Overcast, cold, windy.

Brun

3:47. See a single Brun chasing and swooping at a single brown bird. The latter is definitely not a hummer. How? When ????

See a single Orange-billed Saltator alone. Again.

See a single House Wren alone.

See a pair of Phrygilus gaysi alone. In small trees hedge-like scrub.
(This species seems to be almost as much a "bush-finch" as Saltator.)

Arrive lower part of the same ravine where Pests occur higher up
4:03 p.m. 9125 ft according to my altimeter now.
Nothing at all visible.

See an occasional unidentifiable through fly by

4:18 See a single Bruin alone. Again. Still alone. Silent. In very low scattered scrub and grass.

See another Bruin alone. Again. Again.

See a single C alone. Silent. Same type of vegetation.

Then see a single Bruin fly right by C (only 2 ft apart). The 2 individuals ignore one another.

See another single Bruin alone & silent. And another.

5:08. See a single House Wren alone.

Starting down hill 5:15 p.m.

See another single Bruin. In grass with only a few tiny bushes scattered at irregular intervals.

See a pair of Orange-billed Saltators with some Audubon Sparrows.

See a pair of Orange-billed Saltators alone.

Leaving 5:55

February 4, 1967
Below Palen

Arrive base of path leading to Pest area 5:28 a.m. Raining quite hard.

12
rd. Going to wait for rain to let up a little (hope!)

Rain continues. So go on down to Valdivia area (where I saw the *Perla* yesterday and Brown-hummer interactions earlier)

Arrive 5:40 Just barely starting to get light

5:45 Lots of thrush song.

Dawn Chorus seems to be largely thrush and Andean Sparrows at first. Then a few other things join in.

6:00. Something that sounds like irregular Dawn Calling. "Whit chu whit chu whit chu..." Also "Chua-whit chua-whit chua-whit..." Thrush?

There are really lots of Light-capped Thrushes around. Single birds and pairs. All alone. Not going to cite them individually from now on unless there is something special about them.

Rain thinning out to fine continuous drizzle 6:20 am.

6:26. See single Brown alone

Everything very quiet 6:35

6:41. See single IV hummingbird alone

Then see pair of *Melospiza* XXXX. Feeding together in scrub, like CC's, i.e. apparently picking insects off leaves. Uttering lots of R's as "greetings". Some (not all) of their R's are fluctuating or "rollicking". Sound quite like weak or soft versions of some Firebelly song. These R's may be what I thought were Firebelly songs in the desert area, here, the other day. (I have never actually seen Firebellies in this area this trip. Altho, of course, I have seen them frequently up hill.)

6:50 am. Aha! See a single Atlapetes. Obviously schistaceus. Presumably taezanowskii, although I did not notice black and white on forehead (probably not surprising, as bird was some distance away).

and the rain continued) Singing alone & exposed in small tree 8 ft above ground. SEE TODAY'S NOTES ON ATLA PETES

6:35. See single Brum alone

7:00. See single A. schistaceus (obviously same individual) moving thru hedge. Still alone. Quite noisy, uttering "PN"s and "CN"s

7:20. See another single Brum

7:55. See a single thrush. Sooty all over (brownish-sooty). Coral bill, orange legs, yellow-orange eye-ring. Possibly just "the" Quet o species (LVII A), but it looks larger. Really enormous in fact.

8:10. See another pair of Thlypopsis XXXIII alone. Noisy. See another Brum alone. Silent.

See a IV hummingbird sitting alone and silent

8:27. See another pair Thlypopsis XXXIII alone. Also noisy. Leaving 8:35.

Return to hotel in Jaruma. Also drizzling here.

While having second breakfast here (ca 9:00-9:15 am) see both a P. gayi and a Leglit capped Thrush carrying n.m. !!! The gayi apparently nest-building on or under roof of the hotel.

There last 2 incidents — plus the singing of A. schistaceus — would suggest that the breeding season may be beginning with a bang today. Can this be due to the rain? There has certainly been more rain this morning than on any other day of my visit this year (altho it has been raining at night from the beginning).

The fauna here is really quite surprisingly different from the Quito fauna. There may be almost as great a variety of species (of the humid temperate bush-warbler, bush-finch, tanager and honeycreeper group) here as in Quito, but only a few of the species are common.

Leaving aside the problems of the diglossini, the following questions occur to me.

Why are there so few Parulenterus here ??? Because Myiropus is are so common? (Myiropus are certainly very much more common here than near Quito.)

Why are there so few Atlapetes here? Competition with Saltator or? (Off hand, this does seem to be unlikely.) And why is the local Atlapetes schistaceus instead of rufinucha? I must check on the distribution of these 2 species. It is possible that they are distributed in mosaic fashion all along the Andes. Possibly it is largely due to chance alone which species has become more competitive in any given area.)

Why are there no big blue and yellow tanagers (Thraupis spp., Dubonia, Iridoprocne, Butor, etc.) here, and why are Fire bellies relatively more and (apparently) narrowly distributed here? Competition with Orange-bellied Saltators and P. gairi ???

Why are there no Myioborus here? Are tyrannid flycatchers more common here than near Quito? (My observations would suggest that this may be so.)

Going to work above San Juan this afternoon. Areas where there were lots of Bucconas and CC's during my last visit. Arrive 2:40 p.m. Overcast. Windy. Cold. Nothing much visible at first.

2:58 p.m. See pair of Light capped Thrushes alone.

3:05. Lots of loud thunder, not too far away. Then, a few minutes later, a few light sprinkles of rain.

See several single Light capped Thrushes alone. Going to stop counting them.

3:17. Three CC's flying. Apparently hostile chase. Lots of twittering.

No other species near by.

Brown

See a single Brown alone.

Rain somewhat stronger, 3:35 pm

Then lets up a little 3:50.

See single Horn Wren alone

U

See single α in trees near village. More or less alone (altho there are a lot of finches, including *P. frontata* and Black-headed Goldfinches [*magellanicus*?] panning in and out of the same trees).

4:25 pm See a single Orange-billed Saltator alone. Hopping along ground! Apparently feeding. In very open area (mowed bare ground and small plants) along edge of cultivated field. So this species may provide real competition for finches after all!

Brown

U

4:45 pm See a single Brown alone and silent, in hedge by village

4:52. A single α flies by alone. Uttering "Secret" Notes.

Then see another single Orange-billed Saltator alone. In hedge

5:10. See another single Brown alone in hedge.

U

Then see pair of α 's foraging alone in hedge. The 2 individuals are not very close together, about 5 ft apart. Utter a lot of "Secret" Notes. Also 1 twitter, and 1 burst of triplet song! Then fly off to another hedge. Land about 10 ft apart. One of them utters triplet song as "landing call"!!!

Leaving 5:35 pm. Still raining a little

It is really very remarkable that there are no Couacous here. It looks absolutely ideal for them.

Incidentally, it should be noted that P. gayi also seem to be absent from this area. So the absence of Couacous here cannot be due to competition with gayi.

(2)
February 5, 1964
Below Palca

Going to try to go up to A Pect area this morning. Arrive base of road 5:00 a.m. Not raining (yet) but there seem to be a lot of low clouds about.

Loose my pencils on the climb - so the following is just hoc. Arrive first patch humid scrub just below A Pect area 5:55.

SEE TODAY'S NOTES ON MIXED DIGLOSSINI.

The results of today's observations on mixed flocks can be summarized as follows:

No Whiterests were seen. They really do seem to be quite absent from this area.

Thlypopsis also seem to be absent at these altitudes.

Ditto Basilornis. Why?

There are lots of flycatchers and furnariids around here, but they do not seem to associate in or with flocks.

I heard something rather double whistles this morning. These sounded similar to, but not identical with, the "song" of Dulcinea near Quito.

I also heard various sounds which were reminiscent of House Wrens; but they were, I think, uttered by (a) different species.

Red
Up
Bird I saw a single Pect alone at least 6 times, a single Gy alone once (and I am sure that it was essentially alone all morning), and single and pairs of Breus alone many times (at least 10 or 12 times).

I saw a single Freibell alone once. I cannot be certain that there is more than one pair of Freibells in this area; but I think that there are at least 2 pairs. In any case, it is obvious that Freibell

(114)

is are comparatively rare here.)

I saw 3 A. s. taczanowskii alone. Two birds moving about very close together, and a third moving with them but keeping slightly further away. Quite alone. Uttering lots of "Tut" Notes (SEE TODAY'S NOTES ON ATLAPETES). Also began to hop around quite excitedly when they got near to me. Almost a mobbing reaction. Nevertheless no other bird(s) joined them.

I heard quite a lot of Atlapetes s. taczanowskii songs and PN's (without being able to see the performing birds) earlier in the morning when I first arrived in the area. I am now convinced that there are really quite a lot of these birds in this area, at a high altitude, if not at lower altitudes.

After 7:30 a.m., the whole area was drenched in fog and light rain. Nevertheless, there were still no signs of mixed flocks. I think that I can be sure that mixed flocks are really absent in this area. Possibly, as near Quito, the birds of different species are positively avoiding one another.

Brown I saw one case of inter-specific aggression this morning. A Tree-belly attacked and chased a smaller bird (probably a Brown). Tree-bellies of the central Andean area do seem to be very aggressive!

Going to work at base of road to Peet area this afternoon. Arrive 3:40. Cloudy but no rain (yet). (Note: this is the area where I saw so many Orange-bellied Saltators during my last visit.)

3:55. See a single P. garyi alone. In dense scrub 5-10 ft high. Not in fields.

W Pair of A. s. fly by. Uttering "Secret"s. Then land in bush. One utters twitter as "greeting" or landing call. Then both feed. Apparently in or on clusters

of small purple flowers.

Brown

Pair of *Breus fly*. Alone. Sound together. One utters real twitter as "greeting" or "landing call". Then one flies off. Other remains behind for a few seconds.

Brown

A few minutes later, we saw 2 *Breus* feeding in cactus. Apparently picking insects off leaves. Alone. One or both utter (s) twitters each time one comes near the other.

4:26. One single Orange-bell alone

Leave 4:15 p.m.

Pulca Area 1904 (both high & low)

Hours

Feb. 2 3 hrs 30 min

 2 hrs 45 min

Feb. 3 3 hrs 00 min

 2 hrs 15 min

Feb. 4 2 hrs 45 min

Feb. 5 3 hrs 15 min

17 hrs 30 min

No Humpback
or Sperm
whales

Palca Area 1964 (both high & low)

Feb. 2, 3, 4, 5

No Inds Seen Alone

No Inds in Flocks

|||||
||||| 179

No Spp. in Flock

No Flocks Seen

No Highly Organized Flocks Seen

Largest No. Inds One Flock

Largest No. Spp. in One Flock

Central Peru

(19)

May 21, 1966
Carpuk Pass

Arrive just below top of pass, 8850 ft, 5:53 a.m. Clear
Cool. Just beginning to get light

NOTE. This is good AS-USTF vegetation !!!

First bird songs 5:57 a.m. Possibly by a species of one of
my groups, but I don't recognize it. Several inds. Singing

Otherwise not much in the way of bird sounds

6:04. Hear a few Whistertail songs. NODWAH. Then hear
several more Whistertails in distance. NODWAH.

Occasional patches of fog in neighborhood.

Whistertail songs continue. Completely overlapping some
noisy R's. (R's presumably by flycatchers, not Albes)

6:10. Rather strong wind coming up.

Quite a lot of miscellaneous "CN"s in neighborhood.
But it would appear that most species are not in full breeding condi-
tion

6:20. Now there is a greater variety of bird songs and oth-
er noises. But the "dawn choruses" is far from continuous.

6:27. Hear more Whistertail song. At first, NODWAH.
Then overlaps at random with Atlapetes "Greetings". Then both
species shut up.

A few seconds later, see pair ¹¹PL Atlapetes moving thru
mixed bamboo scrub. 1-4 ft up. Quiet. Definitely alone

Then hear what may be Brown song in distance. NODWAH

Brown

(20)

Shuts up. Then Whitestarts begin again. NODWAH. Shut up.

6:37. Fog getting thicker and thicker. Very difficult to see anything now. This fog does not appear to be stimulating the formation of mixed flocks.

6:45. Birds noticeably quieter now.

NOTE: There are a lot of birds around here which sound like Chlorospingus, but I have not been able to identify them yet.

Catch glimpse 2 or 3 birds flitting about very actively. Both low in scrub and moderately high in trees. Apparently "Luteoverides-types". But very noisy. Uttering lots of "song" phrases. And these are very distinctive! Like very long repeated Whitestart song, with lots of added components, including R's!!!! General effect is not very Basileuterus-like! Could these be Heuripicus frontalis???? Could they be the birds heard uttering Chlorospingus-like sounds earlier??? More important, could they also be the birds heard uttering presumed Whitestart song earlier???? Birds apparently alone.

Fog lifts completely 7:10 a.m.

7:13. Walking down road. I hear some more songs which do sound more typically Whitestart-like. I only wish that I could see the damn things! NODWAH. Shut up.

Then see single "Luteoverides-type". Definitely alone. 6-8 ft up small trees. (Now) uttering "Al N"s. Yellow-rumped one is very broad and bright. And bill does look comparatively long and heavy. So I am now fairly certain that this species is

H. frontalis !!!!

Aha! 7:24. See single Mangarornis. Apparently same species seen in Bolivia and Ecuador. Silent 3-6 ft up in small trees. Definitely alone.

Soon beginning to reach this area 7:28

Setti
Then see large mixed flock. Includes at least 2 ^WWhites
tarts (definite - the yellow spotted species), 2 ^WSettis, 1 ^WYellow
belly (!), 1 ^WET (!), 1 or 2 nondescript "North American warbler
or types", 1 ^WRuddy Flycatcher, 2 ^WPecthicas, 1 ^Wsmall brown wren,
1 ^Wolive woodpecker (possibly CVT), 1 ^Wflycatcher TX, 3 ^WTX's,
and 1 ^Wsmall dark hummingbird. Possibly others. All birds moving
2-10 ft up thru scrub edge road. The wren, hummingbird,
and Pecthicas may have been "casual" associates. Rest of group
certainly highly organized. Most birds uttering lots of "CN"s.
Whitetail sings once. NODWAH. Difficult to tell who, if anyone
was in lead. Certainly not Whitetails or Settis. Probably TX
or TX's most of time.

It would appear that such flocks as may occur here are
characteristic of good weather rather than fog!

Walking up road a few minutes later, come across what
seems to be tail end of same flock. Now definitely being followed
by a single ^WAll-rufous Synallaxis. All rufous definitely buzzing
up rear. Silent. Ranging 1-3 ft up in mixed bamboo scrub.

8:18 am Back up road. Area where presumed H.
frontalis seen and heard earlier this morning. Two birds of this
species are flitting thru mixed bamboo scrub here now. Obviously

Flck 2
8 inds
5:45pm

disputing. Very vocal. Also performing ritualized Wing-spreads. Very close to these birds are 3 All-rufous Synallaxis and 1 flycatcher which looks like Thomomys but has some brownish on back. This must be considered a mixed flock, but probably not a highly organized one.

also 1 "Munchie" EXT
Flck 3
4 inds
11:45pm

8:35. Everything dead quiet now.

8:50. See small, quiet, diffuse mixed flock in mixed bamboo scrub-edge rock slide. Includes at least 1 Th. cyanocephala, 2 Yellowbellies, 2 or 3 small flycatcher-warbler type birds of 1 or 2 other species. Group seems to disperse almost immediately.

Go on to absolute top of pass (8875 ft according to my altimeter now) 9:08 am.

NOTE: The hills around here go only 100-200 ft higher. Covered with forest and scrub to the very top. Or have only tiny patches of "scrub puma" on top.

SEE ALSO TODAY'S NOTES ON MIXED DIGLOSSINI.

COMMENTS: This area obviously very humid on the whole. There have been lots of tree ferns, also fair amount of epiphytes, at all the sites where I have worked this morning. (Also, looking over pass, to NE, can see some "white" Cecropias.)

Flck 3
23 inds
1:17 pm

Cloud coming up 10:20 am. This is followed, almost immediately, by a moderate recrudescence of bird sounds.

Hear more presumed H. superciliosus sounds in usual area.

Flck 4

10:30. Back where diffuse flock seen earlier. Pair of Whitetails flitting about in bamboo scrub and second growth trees. 4-15 ft up. Then I see that they are part of a very large mixed flock.

W?
Sutta
CXX
Pest

ck. Group also includes: 1 bird which looks like a gray-capped vireo with wing bars, 1 "manakin" CXI, 2 Ruddy Flycatchers, 2 "Thromyias-like" flycatchers CXII, 2 CC's, 1 Sitta, 1 Yellow-belly, 1 Plush-capped Tanager (!), 1 GT, 1 Delectraupis (!), 3 H. atropileus, 2 Chlorospingus types, 3 CX's, 2 hummingbirds of different species (one probably Green & White).

A single Pest appears with group for a few seconds, then disappears.

All birds quiet, but utter lots of soft "CN"s.

Group as a whole moves thru a great variety of vegetation. H. atropileus and Plush-capped Tanager stick pretty much to mixed bamboo scrub, 1-4 ft up. GT and Delectraupis stay low, 1-4 ft up, in greater variety of scrub. All or almost all other species ranging 3-20 ft up. CX's probably more frequently high than any other species.

Whitetails in lead part of time. Then CX's in lead.

Group as a whole very diffuse but undoubtedly highly organized. Almost certainly also partly the same as first large group seen earlier this morning.

Sutta
W?
CXX

Sitta f → ?'s twice. Presumed Vireo f → Whitetail once. GT f → CX once. Ruddy Flycatcher attacks → Whitetail!

Group as a whole gradually drifts down hill. Lost to view.

Leaving 11:25 a.m.

NOTE: The "Chlorospingus-types" in the last flock pro

likely were canigularis or some closely related form. Gray heads
 White throats. Boundary between gray and white gradual.
 Underparts yellow. Upper parts yellow-olive. Wings and
 tail darker. I.E. these birds looked very much like Enemoscopus.
But they definitely had completely dark (not red) bills!!!

GENERAL COMMENTS:

Today's observations were rather a surprise to me!

The proportion of birds involved in mixed flocks here is
remarkably high. Probably quite as high as in any other part
 of the Andes — even the Western Cordillera of Colombia. (Probably
 the observational conditions — or my methods of observation —
 tended to exaggerate the percentage of birds in mixed flocks.
 Possibly I overlooked many birds not in mixed flocks, or possibly
 the birds not in mixed flocks tended to remain hidden. But,
 certainly, it would be impossible to explain all the surprising
 features of today's observations by ascribing them to "artifacts" of
 this type.)

At the same time, the number of flocks seen was not
 comparatively high. Many more flocks would have been seen in
 similar environments in Colombia!

To sum up, the birds here seem to be similar to those
 of the Quito region insofar as some are gregarious while others are
 not. But the gregarious birds here seem to be more strongly greg-
arious than the comparable birds of the Quito region.

Possibly, it may still be convenient to recognize 2 extr-
eme types of social behavior in this "Andean Tanager Association".

A. Strong inter-specific gregariousness throughout a whole region. As in the Western and Central Cordilleras of Colombia.

B. No inter-specific gregariousness. As in large parts of Central Ecuador and Central Peru.

But it may be convenient to recognize two different types of "intermediate" behavior. A. Moderate to weak interspecific gregariousness throughout a whole region. As in the Sierra de Mérida and the Eastern Cordillera of Colombia. B. Strong inter-specific gregariousness confined to strictly limited areas. As on the road to Santo Domingo in Central Ecuador. And the area(s) visited today.

The fact that the interspecific gregariousness observed today was "stronger" than any observed in Central Ecuador may be correlated with the fact that the "humid temperate zone" is narrower here than in Central Ecuador. Or perhaps the birds of this area are "tending toward" the extreme gregariousness of their relatives in Bolivia ???

(Possibly, some of the gregariousness of the birds observed today may be correlated with the fact that they are very near a major "geographical" frontier ??? They are only a few miles from the Huallaga River valley. Thus, their position is not unlike that of the birds around Chachapoyas.)

NOTE: Even though a number of brightly colored tanagers were seen here today, they were still less common than in many other regions of the Andes. (This is all the more significant as the areas visited today were not of very high altitude.) Thus, tod

ay's observations do not necessarily conflict with my earlier conclusion that species are more segregated here than in many other regions.

NOTE: It must be significant that P2 Atlapetes (and the presumed H. frontalis) definitely were not associated with the flock seen this morning. Possibly also significant that Margarornis apparently was not associated. (I might add, in this connection, that all other dendrocolaptids appeared to be rare or absent here.) Thus, some species appear to be non-gregarious here — in spite of the fact that there are flocks here, and that the same species are gregarious elsewhere!!!!

NOTE: One point might be stressed. Although in the Central Andes, mixed flocks may be confined to frontiers with the Upper Sub-Tropical Zone, they certainly occur along other types of frontiers in Venezuela, Colombia, and Bolivia!

May 22, 1966
Cayush Pass.

Going to work slightly different area this morning. Just past vent of pass, on eastern slope. Arrive 5:30 a.m. Still quite dark. NOTE: This area must be slightly lower than the area worked yesterday, but it registers as 9000 ft on my altimeter now!

Walk down road to 8925 ft, approximately. There seems to be more bamboo and other second growth here than in the area wo

rhed yesterday. But also quite a lot of VSTF type trees

First miscellaneous bird sounds heard ca. 5:50 a.m. Starting to get light now. First DC 5:55. H. atripennis? Also some other, more elaborate, song phrases. Possibly Whitestarts. NOD WAH. Also some thrush sounds (not song) DC stops.

6.01. Now there is lots of this presumed Whitestart song. By several inds. Overlapping one another, but all NOD WAH. White starts shut up. DC starts again. Stops. Presumed Whitestarts begin again. Then DC starts again. Complete overlap.

6.11. See single PL Atlapetes On ground and low in scrub on old landslide. Silent. Definitely alone.

Fog starting to come in 6:17 a.m. General volume of bird sound is decreasing.

6.32. Walking back up road. See single Yellow-belly alone ca. 10 ft up in isolated VSTF tree.

6.36 See definite mixed flock. Includes 2 ^{VV} PL Atlapetes, 1 blue & yellow tanager (possibly Battaropus eximia!) All 3 birds moving 3-6 ft up region mixed bamboo scrub. PL's utter lots of "PN"s. PL's f → tanager repeatedly!

6.53. Quite a lot more presumed Whitestart song. All NOD WAH.

6.59. See a pair of PL Atlapetes 3-6 ft up in scrub. Certainly same pair seen with flock earlier. But apparently alone now.

7.03 A single blue & chestnut bird (Delotrochus ???) flies across road. Silent. Definitely alone.

Sun has reached this area now.

Wade 5
3 inds
2 spp

Wade
6:40

7:15 a.m. Region mixed bamboo scrub just below 9000 ft. See mixed flock. Includes at least 2 *Hemiprocne* or *Banisteria* types (almost certainly *H. frontalis*), 2 nondescript flycatchers, 1 finch or tanager (almost certainly *Plush-capped*). All birds 3-4 ft up. *Agelaius*-type (possibly same species as on Munchique) → group. Group not highly organized. All birds scatter.

NOTE: I am now almost certain that all the Whitestart-like songs heard this morning were really uttered by the *H. frontalis* types.

7:40. Walking down road. To 8800 ft. There really appear to be remarkably few birds here! In spite of the fact that the vegetation mixed scrub and VSTF, looks quite "promising". Everything very quiet.

A few minutes later, ca 8775 ft, see single Pict in scrub 2-4 ft up. Silent. Now definitely alone. But probably has just left a mixed flock 40 ft away.

This flock includes at least 1 Whitestart, 2 *H. atropurpurea*, 1 Sitta, and 1 dull grayish *Diglossa* - streaked underneath - i.e. almost certainly of Bari!

H. atropurpurea in bamboo scrub, 1-3 ft up. Whitestart and Sitta in mixed scrub 3-6 ft up. Whitestart (or maybe Pict) sings. NODWAH. Other birds silent. Flock disappears without my being able to tell who, if anyone, is leading.

A few minutes later, see Whitestart and Pict only 2 ft apart (again?) Both silent. Pict flies off. Whitestart does not follow.

Pict

Sitta
Wade
6:40

Pict?

Pict

Barn
Ogm

Sub?

NOTE: This is a remarkable place to find Barn! Possibly Barn
birds tend to "stray" more than birds of other *Diglossa* species. This
would explain why Barn reached Central America.

A few minutes later, hear more Whitestart or, more probably,
Pied Song. NODWAH. Shuts up.

NOTE: So far this morning, almost all flocks seen have been
in sunny areas. Areas still in shade seem almost deserted.

8:13 am Ca 8400 ft See single Blue & Orange Tanager (the
distinctive local subspecies - identification definite). 20 ft up in VST
F tree. Silent. And definitely alone.

Black &
14 and

CORRECTION: A few seconds later, I see that this Blue & Or
ange is part of a large mixed flock. Group also includes 2^W Yellowbell
ies, 2^W *H. atrorubris*, 2 *EX*'s (*Pseudospingus*-types), 2 small tree
creepers (possibly *Margarornis*), 3 or 4 other small warbler-
like birds (probably 2-3 species). Group as a whole diffuse. But
the Blue & Orange and the Yellowbellies show a definite tendency
to stick together. In spite of the differences of the group, all the
birds drift in same direction. I.E. group is highly organized.
But leadership changing. All birds quiet. Most birds ranging
10-20 ft up in mixed scrub - VSTF. *EX*'s and tree creepers seen
only in trees. *H. atrorubris* ranging 10-15 ft up.

8:54 am. Walking back up road. See a pair of Yellowbellies
flying. Uttering "PN"s. Alone.

9:03. Further on. See pair Vireo-like birds. 10 ft up second
growth trees. Possibly same species seen with flock yesterday. But this
pair definitely alone now.

Everything dead now, 9:18 a.m.

9:31¹⁷. Near can (9000 ft). See pair ^WWhitetails. Flycatching in trees edge pasture. Alone.

Fog starting to come in again 10:13 a.m. This does not provoke a new outburst of bird noises.

Leaving 10:40 a.m.

COMMENTS:

My observations here are the "fumbling blow" to the theory that mixed flocks are positively correlated with density of population. The population of my species (considering the groups as a whole) are comparatively small, but inter-specific gregariousness is comparatively highly developed!

I did not see as large flocks today as yesterday. But I did see a larger number of flocks today. This is significant because the vegetation of the area worked today was much less nearly "virgin" than that of the area worked yesterday.

On the way home, I tried to survey the areas surrounding this Carpuk Pass. Of course, cultivation is spreading in all directions. But it does seem likely that the Carpuk Pass areas where I have worked are nearer to the original boundaries of the Upper Sub-tropical Zone than to the original boundaries of any other zone. (Huancayo itself is in a very arid area, but it is 2 hrs drive from Carpuk.)

It is possible, in fact, that the original Humid Temperate Zone of the Carpuk Area was surrounded by Humid Upper Sub-Tropical Forest on all sides! I.E. there may have been a narrow

"fringe" of USTF between the humid temperate forest and the nearer dry area.

May 23, 1966
Panama

We came out to this area in the hope of finding montane forest. Without success. Finally arrived at "La Molino", a "trout-raising station" 7400 ft. Dry. Cultivated. Some scrub along stream. 6:10 a.m. Clear. Moderately cool.

6:18. A pair of Yellow Grosbeaks flies by. Silent & alone.

6:40. See single *Myiopos* (presumably usual species) in hedge by corn field. Silent. There also are Andean Sparrows in same hedge. But the 2 species seem to be ignoring one another. Then the *Myiopos* flies off. Nothing follows.

SEE TODAY'S NOTES ON MIXED DIGLOSSINI

NOTES: I saw several single thrushes (apparently sooty) and Orange-billed Saltators, alone, at both the first and second sites visited today.

There were absolutely no traces of any mixed flocks (of species of my groups) at any sites.

May 24, 1966
Carpenter Pass

Arrive area 8425 ft., Huancabamba side of Pass, 5:25 a.m. Still dark.

Cloudy. There was occasional rain on trip out.

Rain starts again almost immediately. Quite hard. Miscellaneous bird sounds have begun by 6:00 a.m. But it is still too dark to see, and rain is getting heavier!

Vegetation here is rather lush but mixed VSTF and second growth.

Most of the bird sounds ca 6:15 are Andean Sparrows, wrens (there is a small pasture and a few shades not far away), and various species which I do not recognize. I can catch very brief and poor glimpses of a few birds moving very low thru scrub; but most are quite invisible.

Going to walk along road 6:30 a.m.

Hear lots of Whitestart-like songs. All NOBWAH. Then then stop. Hear one long phrase which may be by Pect. Only slightly up hill! Stops. Then Whitestart-like songs start again.

Mutual song inhibition (still) seems to be operating perfectly!

6:44. See pair of Whitestarts. Silent. Flycatching 3-6 ft up in second growth scrub. Apparently alone.

Rain is decreasing now. Bird sounds increasing.

6:53. Walking up along side path, can hear lots of R's. Either flycatchers and/or Baris.

7:04 a.m. 8350 ft. Region very mixed second growth. Come across definite mixed flock. Includes 2 presumed *H. frontalis*, 3 or more *Synallaxis*. (Latter look rather like All-rufous but are definitely different species. Grayish toward rear below. And have trace of indistinct light supercilious stripe.) All birds ranging 3-6 ft up. All very

Put?

Gen

Wade 9 7:00 a.m. 8350 ft. 7:00 a.m. 8350 ft.

close together. All noisy. Presumed H. frontalis utters Whitestart like song. Synallaxis mob me. Then Atropetes torquatus s ———> group! silent. Moving from ground to 2 ft up. Then hummingbird (with light crescent on breast) s ———> group 4 ft up. Then group moves off. Can't see who is leading.

7:20 8000 ft. See pair of birds 10-15 ft up second growth tree near small pasture. Either tanagers or Pipilo sp. Olive back and wings. Dark head. Silent. Apparently alone.

A few minutes later, some distance away, see definite mixed flock in second growth woods. Includes at least 2 Yellowbellies, 1 Synallaxis, 1 H. atripileus, and 2 or 3 birds which are either presumed H. frontalis and/or B. nigrocinctus. Moderately noisy. Flock now dispersed. Possibly not highly organized. Yellowbellies 10-12 ft up in trees. Other birds 5-10 ft up trees & scrub.

While this flock is around, I hear what sounds like a song of northern type. But I can't see the bird uttering it.

NOTE: This atropileus was not in bamboo (altho there is some bamboo several hundred yards away). I.E. it probably followed the other species out of its "usual" habitat.

7:40. Rain almost or completely stopped. But fog is starting to come in from top of mountain.

Catch brief glimpse single Whitestart in valley downhill. Apparently alone. Sings. NODWAH

7:50 8000 ft. See a pair of thrushes flying alone.

7:53 See group 2 or 3 furnariids 2 ft up second growth scrub. Presumably species of Cranioleuca. Whole front of face as well as

10000 ft
5000 ft

Also 1 Myiarchus

crown white. Apparently alone.

8:03 a.m. 8410 ft. Come across diffuse flock. 1 or 2 Yellow-bellies, 1 Myiophobus in trees. 2 or 3 Myiophobus and/or Basileuterus as types in scrub. Probably essentially the same as one of the groups seen earlier.

8:13. Everything very quiet now

NOTE: General aspect of vegetation in this area is very reminiscent of Agua Bonita below Bogota.

Starting downhill again 8:25 a.m.

Some yards down path, see a pair of what look like the Yellow-bellied Cuckoos of Panama! Alone. 2 ft up very dense scrub.

8:40 ft 8:40 a.m. See a single Rusty Thrush (identification definite). Silent & alone. 12 ft up second growth tree.

SEE ALSO TODAY'S NOTES ON MIXED DIGLOSSINI

8:54. 8540 ft. See single large dendrocolaptes 10 ft up in second growth tree. Probably same TUT seen below San Juan. Silent. Definitely alone.

Then this bird flies down hill. Join's —————> very diffuse, scattered group in second growth woods edge pasture. Group also includes 1 Cy (definite!), 1 Th. cyanocephala, 1 TX (Pseudospingus type), and at least 2 or 3 others.

Then I see 4 Big Bullfinches (definite) 10-30 ft up in trees, several hundred yards away. Definitely alone (moving in opposite direction from flock).

9:25 a.m. 8445 ft. Come across (another) very diffuse flock. Includes at least 4 or 5 Synallaxis types (species with faint sup

11 birds
3 spp

Flock 11

12 birds
5 spp

Flock 12

9 birds
6 spp

Flock 13

exclusively seen earlier), low in scrub. 1 ^② *Cyanocephalus* and 1 ^③ *Myiarchus* chus and 1 ^④ *T.* all in trees. 1 ^⑤ *Sooty Thrush* j → group. 1 ^⑥ *Pet.* flies out of bush when *Synallaxis* flies in. Probably there are still other species in scrub.

This group probably is combination of 2 groups seen earlier. *Synallaxis* are noisy. Other species quiet. *Synallaxis* apparently in lead!

9:33. Almost down to road again. See single *P.L. Atlapet.* is. silent. 3 ft up scrub edge stream. Apparently alone.

... The *P.L.*'s here really are remarkably non-gregarious!

COMMENT: The fact that such a high proportion of the birds here occur in mixed flocks is largely due to the absence of other species! (*P.L.* species of denser and/or more open habitats, e.g. *A. rufinucha*, *B. macrocratus*, *Tumbelly*, *carbonaria*, s.l., which are of variable gregariousness in other parts of the Andes.) In this respect, this area differs from the area below San Juan in Central Ecuador (where the variable species were present and partly gregarious).

9:54. Down by road, see single *Whitethroat* in tangle edge ravine. Silent. Definitely alone.

10:02. See a pair of *C. XIV* feeding in second growth trees 6-20 ft up. Silent. Definitely alone. I am sure that these are the birds I saw with the large mixed flock on May 21 and which I confused with *CC's*!

10:32. A little further up road. See single *Ruddy Flycatcher*. Uttering R's. Flycatching 2-6 ft up very poor second growth scrub.

Carbonaria

Definitely alone

10:46 a.m. Walking back down road. See pair ^{vv}Whitethroats feeding 6-12 ft up in scrub. Quiet. Definitely alone.

A few minutes later, see a very diffuse but probably highly organized flock moving thru trees, 15-20 ft up, on both sides road. Group includes 2 Yellowbellies, 1 M. cyanocephala, 2 or 3 ^{vv}undescript flycatchers (probably all same species), 1 or 2 of the usual gray capped vireos, 1 of the manakin-like birds. All birds quiet. Leadership apparently changing. cyanocephala j —————> Yellowbelly. Yellowbelly j —————> cyanocephala.

10:59. See single Agriornis (robin-like species) alone

Leaving 11:02 a.m.

Just as I go, see another single Pect silent and alone

COMMENTS:

The area worked today was just at the edge of cultivated areas (small farms, pastures, a few small and not-very-successful cooling Eucalyptus plantations). I.E. as near to the arid temperate zone as it is possible to get, without abandoning natural vegetation completely. Thus, the mixed flocks seen today were particularly significant. I saw relatively more single birds and pairs alone today than on previous days in other parts of this area, but mixed flocks unusually were at least moderately common today. This is conclusive!!!

Incidentally, I made another check of the vegetation surrounding this area on my way home today. Observations of the few "natural" trees and scrub-patches left between Carpish and the

March 14 1968

Pect

nearest town, Ayacacho, would appear to confirm the suggestion that this whole Carpiak area was once completely surrounded by USTF.

If I had made observations only near Carpiak, I would think that mixed flocks were positively correlated with density and extent (height) of vegetation — nothing else. But this probably would not explain variations in mixed flock frequency in other areas. I think that I must involve "frontier concepts" in order to explain the situation in such regions as Central Ecuador.

In this connection, I must try to distinguish between two different types of "ratios." ① Frontier with Humid Upper Subtropical Zone vs total area of region inhabited. ② Total extent of all frontiers vs total area of region inhabited. Is it possible to distinguish between these two? If so, is the distinction important?

(Probably yes! For instance, both the Western Cordillera of Colombia and this Carpiak area may have well highly developed flocks simply because almost all their frontiers are with the Humid Subtropical Zone. I.E. they do not touch much Páramo or Páramo, or And Temperate or And Sub-tropical Zones.)

One peculiar feature of this whole Andean problem should be stressed. In the North (and probably the South) it is the total effect of frontiers on whole regions which seems to be important. In the Center, by contrast, it seems to be the effect of frontiers of particular areas on those particular areas which is most important.

NOTE: According to the local people, the seasons here are

almost the exact reverse of those in Panama. Rainy season begins in December. Lasts about 3 (4) months. Rest of the year dry.

May 23, 1966
Carpenter Pass

Going to work on Huamanc side of pass again. Another ravine. Higher than the one worked yesterday. 8800 ft according to my altimeter now. Arrive 5:45 am. Starting to get light. Clear. Fog already present at slightly higher elevations.

A few miscellaneous bird sounds (mostly thrush) ca 5:53.

Vegetation here somewhat mixed. Lots of dense scrub and

Pect? low forest. Some obviously second growth. Some apparently AS.

Hunt Pect or Whistler-like song 6:00 am

6:02. Now I am almost certain that the bird uttering these songs

Pect? is Pect. Songs quite typical in form. Except that they are divided into somewhat shorter phrases than most songs uttered later in the day. Nevertheless, the bird is uttering phrase after phrase at very short intervals. All songs NODWAH.

Then the pair PL. Attaches soft away. 2 ft up in AS. Definitely alone. Utter "Greetings". Completely overlapped by presumed Pect song. Then PL's utter 1 or 2 Whistle songs. Also completely overlapped by presumed Pect. PL's move away.

Presumed Pect continues as before. Then there is a sudden outburst of loud R's and more formless twitters, mingled with song from same area. And then I see that there is a pair of presumed *H. frontalis*.

is in this area !!! Apparently alone !!! Ranging 2-6 ft up. And then I see that the presumed Peet Song definitely is being uttered by one of these presumed H. frontalis.

Peet Song I really don't see how Whistlers, Peets, and the presumed H. frontalis keep themselves sorted out in this region! Is it by singing at different periods of the day ???

6:30. There seem to be a lot of presumed H. frontalis singing in this general area now. But everything else is rather quiet.

6:32. See a single Yellowbelly. Quiet. 3 ft up in AS. Apparently alone.

6:37 Slightly down road. Hear what may be Atlapetes torquatus song down in ravine. NODWAH starts up. Then there is another burst of presumed frontalis song. Also NODWAH.

6:48. Walking back up road. See another single presumed frontalis 1 ft up second growth scrub. Definitely alone. Uttering "al" CN's. Hees off.

Things becoming quieter now, 6:52.

Walking up road, see another pair presumed frontalis alone. This certainly is one of the least gregarious species in my groups!

Will! Will! Will! 7:00 a.m. Reach 8845 ft. Bottom limit of area worked May 21. See mixed flock uphill. Includes at least two Yellowbellies and two Margarornis. Flying from tree to tree in AS. Obviously highly organized. Margarornis f —————> Yellowbell is repeatedly!

At same time, another, much larger, mixed flock appears, moving along road, slightly downhill. Includes at least 3 EX's

Hark 15
4 words
2 spp

Black 16
18 19 20
17 app

(40)

also 1 Whitestart -
and 1 PL (111)
(the Pseudospingus - types), 1 Blue & Orange Tanager, 2 Yellowbellies,
1 Dulania (definite), 1 H. atropurpureus, 2 presumed H. frontalis
(inc 1), 3 "all rufous Synallaxis with light eye-rings" (EXVII),
1 CC-like species (EXIV), 1 of the gray capped verreauxi types, and one
of the "manabius" (usual species). Birds moving thru very mixed
second growth scrub and small trees. Synallaxis and presumed frontalis
tending to stay low, 2-4 ft up. Most others ranging higher,
5-20 ft up.

Group obviously highly organized. All birds close together.
At first EX's are in lead. Yellowbelly j → EX's. Then the
Blue & Orange jumps into lead. Yellowbelly f → Blue & Orange.
Dulania and Whitestart usually at rear.

Group as a whole noisy. Some Whitestart and/or presumed
frontalis song.

There certainly were no Conirostrum with group.

NOTE: I am fairly certain that the presumed "all rufous
Synallaxis" seen in this area before were EXVII's.

COMMENTS: The two flocks described above were only
100-125 yards apart at one time. But, as far as I could tell, they
did not join one another.

The larger of these two flocks probably was largely the
same as one of the flocks seen on May 21. I.E. flocks may be "long
sustained" here.

Sun reaches this area ca. 17:30. At same time, wind
starts to come up.

Everything is very still indeed, apparently deserted, after

Conirostrum

flack 1st
2.5 w/da
+ app

these flocks have moved on.

about 1800-1900!

Walking down road. 8:04 a.m. 8045 ft see very large flock flying thru tree-tops in VSTF. Downhill, in ravine, a considerable distance away. This probably is partly the same as the large flock seen up hill earlier. But, if no, it has become even larger in size. Now includes at least 20-25 inds. Among them are: 3 TX's, 1 or 2 Yellowbellies, 1 Whitestart, 2 Ruddy Flycatchers, at least 1 flycatcher TX, 1 Cy (sic!) 2 litters. Group is scattered over a very wide area. But obviously highly organized. TX's probably in lead most of time.

Before group appears, I see a pair of Thlypopsis feeding low in bamboo scrub. Obviously alone. But then the Thlypopsis get "swept after" the group. Thlypopsis f —————> group repeatedly.

Just

8:20. A few yards further down road, see single Pet. 8 ft up in low, semi-AS, scrub.

Just

8:36. A few yards even further down road, see pair Hemisp ingus or Baudinensis types very low in scrub by slide. Quiet. Definitely alone. These birds may have been "true" luteoviridis!

Then hear long Pet song uphill. NODWAN. Stops. Then hear "Northern Cy" type song across ravine. Also NODWAN. Stops.

8:44. Same area. See single ♂ Yellow-Groove alone 10 ft up in second growth tree.

8:48. See single Sooty Thrush (definite) feeding low in scrub adjacent slide.

9:02. 8025 ft. Small Eucalyptus plantation surrounded by thick scrub. See single Yellowbelly 15 ft up in Eucalypt. Alone now. Utters "Zeeewee zeeewee zeeewee zwoor" (Very bonariensis-like!!!)

Stack 18 8 birds
3 spp

(42)

Then Yellowbelly flies to join mixed flock 100 ft away in scrub. Flock also includes 2^W Whitestarts, 2^W Margarornis, 3 or 4 other birds (probably 2 or 3 different species). Highly integrated. Whitestart is definitely in lead. All others follow repeatedly.

Stack 19 4 birds
2 spp

A few minutes later, and a few yards back up road, see another mixed flock. Includes 2 Yellowbellies and 2 P's! All 2-4 ft up in roadside scrub. P. f. → Yellowbelly

NOTE: This area, with its rock slides, second growth, plantations, etc., looks ideal for A. rufinucha. Its apparent absence is very remarkable.

9:25. A few yards further on, see what may be same pair of Yellowbellies. Now apparently alone. Feeding between 1 ft and small tree edge of slide.

COMMENT: As far as I have been able to tell, all the species here are feeding in the same ways as in other parts of the Andes.

9:41. See a pair of Blue & Oranges moving low thru scrub - AS scrub. 2-4 ft up. Very noisy. Lots of "see see see" Notes. But quite definitely alone. (This is area where Peet was seen earlier this morning, but it is not audible or visible now.) Then the Blue & Oranges move right past an Acolluca. No overt reaction of any sort between the 2 species.

9:51. Looking down into ravine where large flock was seen last. See pair^W Whitestarts flycatching high in trees. Also 3 or more Synallaxis being noisy low in mixed bamboo scrub. But the 2 species are far apart. I think that they must both be classified as "alone." The (rest of the) flock seems to have moved on and/or dissolved.

Fog coming back in 10:30 a.m.

Will! Will! Will! 10:32 Back up to lower limit area worked

May 21. See pair of GT's moving thru AS. 8-12 ft up. Moderately noisy. But definitely alone.

Leaving 10:50 a.m.

SEE ALSO TODAY'S NOTES ON MIXED DIGLOSSINI

May 26, 1966
Canyun Pass

Going to work on Surgo-Manna side of pass this morning. Farther down than on May 22. Arrive area 8650 ft 9:48 a.m. Clear. Cool. Some fog up hill.

This area seems to be thick second growth scrub with patches VSTF.

First miscellaneous bird sounds 9:51. Then brief burst Whitestart-frontalis type song. NODWAH. Shuts up. Then quite a lot of bird sounds by 9:58 (Big Buttercupis ???, also some R's). Then more presumed frontalis song. NODWAH.

Boris? During next few minutes hear a lot more of both R's (which may be uttered by either Boris or flycatchers) and frontalis song. Alternating without overlap!!!

Then see group of 3 Whitestarts feeding 4-10 ft up scrub. Definitely alone. Silent at first. Apparently quite unaffected by fact that frontalis is singing (NODWAH) 20-30 ft away. Then 1 Whitestart begins to sing. Presumed frontalis shuts up immediately!!!

Whistler continues NODWAH. Flirts up. Presumed frontalis starts again NODWAH. Perfect mutual inhibition of song!

6:16. Flights down road. See pair H. atropurpureus 1-2 ft up in low thick scrub (not bamboo) on old slide. Feeding. But apparently alone.

Then see single Sooty Thrush alone

6:26. See bird uttering R's (NODWAH). It is Ruddy Flycatcher 2 ft up sparse scrub of cliff. Feeding alone. 8600 ft.

6:33. Come across H. atropurpureus again. Now see that there are 3 inds of the species here. All moving close together, 1-6 ft up mixed scrub (with some bamboo in it). Picking insects off great variety of leaves. Uttering "CN"s. Then single Thlypopsis & atropurpureus. Lands right beside them. Begins to feed.

6:33
seen 4
2 up

Then whole group moves off together. Obviously very highly integrated. No sign of hostility. Thlypopsis & atropurpureus at least a couple of dozen times!!! And, as far as I can tell, the Thlypopsis is feeding in exactly the same places, and using the same methods, as the atropurpureus!!!

NOTE: All the Thlypopsis seen around here have had gray wings and back, orange heads, and orange underneath except for white patch center lower breast and belly.

See single presumed frontalis alone 2 ft up scrub.

Birds are generally much quieter now. 6:48

Walking back up road, see 2 more Sooty Thrushes alone.

7:01 Back down road 8600 ft. See single Pict. silent. Alone. Feeding low in scrub. Also feeds on ground at least 3 times!!!

Red

Then come across mixed flock low in second growth scrub edge road. Group includes 3 Synallaxis-types (unidentified), 2 presumed frontalis, and 2 PL Atlapetes. Highly integrated. Synallaxis apparently in lead. Group as a whole usually quiet. But frontalis sing occasionally. Synallaxis-types not as very noisy.

NOTE: This is just across road from where Myiophobus - atropileus group was seen earlier. But latter seems to have gone on.

A few minutes later, and only 30 ft down road, come across another mixed flock. Includes 1 flycatcher CIX, 1 Sitta, 2 GT's, 2 Blue & Orange Tanager. Moving 3-12 ft up small trees edge cliff. Quiet but highly integrated. CIX and GT's in front but widely separated from one another. Followed by Blue & Orange. Sitta bringing up rear.

This group eventually goes up hill. It does not join the PL - Synallaxis - frontalis group (altho the latter is quite audible and, probably, visible).

7:32 a.m. 8445 feet See very large mixed flock. Includes at least 2 Margarornis (definitely usual species), 1 flycatcher CIX, at least 4 (probably 5) Sittas, 2 or more CIX's, 2 presumed H. frontalis, at least 1 Blue & Orange. When group first seen, the CIX's, Sittas, and Margarornis were 30-50 ft up in VSTF trees. Then these birds flew down into very low scrub on slide. Only 1-2 ft up.

And it is only then that I became aware of the presence of the other mixed

Group as a whole moderately quiet. Highly integrated Margarornis usually in lead.

NOTE: The CIX's have light eyes - just like northern

April 21
12 wds
3 spp

April 22
12 wds
1 spp

April 23
13 wds
1 spp

April 23
13 wds
1 spp

Pseudogygis

Sum has reached most of this area now.

7:58 8425 ft. Catth glumpse 2 or 3 ~~TX~~ 's low in scrub on slide. Quiet. Apparently alone.

Go on down to 8350 ft 8:12 am. Then start back up road.

8:28 Not far from where last large mixed flock seen.

8:28 10 birds 2000

See what appears to be small flock in mixed bamboo scrub under VST F trees. Includes 2 H. atripileus and 2 pinus frontalis. Possibly others. Very far away from me, and difficult to see clearly.

8:28 5 birds 5000

A few minutes later, somewhat further up road, catch glimpses of apparently small diffused flock in VST F trees. Includes 1 manul-type, 1 Whitstart, 1 Margivornis, 1 flycatcher ~~TX~~.

Probably 1 or 2 others.

Both these groups may be largely remnants of the large flock seen earlier. But they probably should be classified as 2 separate, non-integrated, flocks now.

Everything is dead quiet 9:00 am.

9:03 8500 ft See single Whitstart 4-6 ft up second growth scrub. Uttering "cat"s. Alone.

Go back up to car, then start down road again.

Out

Marlong Pect pligase. NODWAH.

9:23. See single Ruddy Flycatcher alone. Probably same ind. seen alone earlier this morning.

9:28 8500 ft See pair ^W Blue & Orange Tanagers. Quiet. Definitely alone. 2" up scrub edge road. Then fly away into second growth trees.

But

9:47 8475 ft. see single Pest alone. Feeding small tubular red flowers 1-4 ft up scrub edge road silent.

10:01 8350 ft. see single Th. cyanocephala. Apparently alone 2-3 ft up second growth scrub.

10:07 Clouds coming up, and I am starting back up hill. Still at 8350 ft, see a single Blue & Orange fly across road. Sil cut and alone.

10:34 8550 ft see group 2 or 3 flycatcher TX ^W flycatching in semi-NS. 3-10 ft up. Apparently alone.

It certainly looks as if mixed flocks tend to "disolve" in mid-morning here.

Also see single Ruddy Flycatcher in usual place, 30 ft away. Also alone.

March 20
WCC
9:47

Speak of the devil! Only a few minutes later see definite mixed flock. Includes 3 Chlorospingus types TXIII, 1 CC-like type (TXIV), 1 ♂ Red Woodpecker (apparently same species as in Venezuela), 1 ♂ ^W WCC (blue headed form), and, probably, 1 ♀ WCC. All birds ranging 2-6 ft up thick second growth scrub. In exact same area as PL-frontalis flock earlier this morning. All birds close together. All quiet. Chlorospingus-types probably in lead.

1 Ruddy flycatcher } → group.

WCC

NOTE: The ♂ WCC was behaving in usual Cowbird manner. Pecking insects off leaves. But perhaps slower and more sluggish than most other forms of the genus (including the white-capped WCC) with which I am familiar.

Same flock back 10:55. Now see that it also includes 1 Th ^①

Pet

⁽¹³⁾ ✓ cyanophala. And then, 1 Pet j → flock. Then Pet flies away. Nothing follows.

Now see that flock also includes 1 ⁽⁷⁾ ✓ Gray-capped Vireo-type. And 2 Whitestarts! And another Ruddy!

Flock gradually moves down hill. Out of sight.

Little WCC

Is it significant that this flock did not include Setthis ???
Are Setthis and Blue-capped WCC mutually exclusive ???

Leaving 11:10 a.m.

May 27, 1966
Above Panao

Going to start work in area where Bari was heard uttering "zee zee zee..." patterns a few days ago. Arrive 5:51 a.m. Getting light. Clear. Cool. Dawn chorus in full swing.

SEE ALSO TODAY'S NOTES ON MIXED DIGLOSSINI

6:15 See several sooty Thrushes alone.

6:17 See single Mountain Catanga Perched silent and alone 5 ft up in scrub.

Then catch glimpse of Atlapetes that has been singing. 4 ft up in scrub. Definitely alone. Unfortunately, in such bad light that I can't be sure of species. Probably PL.

SUMMARY:

It may be useful to add a general description of this area. It is a large patch of scrub-forest along stream ravine. Patch is approximately 3/4 mile long, several hundred yards across.

In the center of the ravine are a cluster of tall trees. Most of these obviously second growth. But some, or a few, appear to be "mature VS TF" in general effect. On either side of these trees is thinner and lower scrub, interspersed with small trees. Obviously, second growth. This merges into cultivated land (maize fields) and/or very sparse scrub-grass (obviously the result of cutting and burning over the years).

I imagine that the climate of this area is very humid. Note the relative great abundance of hummingbirds, H! Also the presence of *P. Atlapetes* and *Thlypopsis*. Possibly the apparent absence of CC is another indication of relatively great humidity?

My impression, during the course of the actual observations this morning, was that the average population density of birds here was high. Looking over my notes, and counting, however, I see that the density of birds of my groups is comparatively moderately low. (Altho population is both denser and more varied here than around Palca.) But it should be stressed that the area is inhabited by a great many hummingbirds, *Sporophila luctuosa*, and a fair number of (other) flycatchers, in addition to the species of my groups. Thus, the population is moderately dense as a whole.

There was a lot of bird noise here this morning. This would suggest that many of the birds here are in breeding condition. If so, this is in great contrast with the birds of the Carpish Pass area (except the presumed *H. frontalis*).

In a way, today's observations were rather a relief to me. I summarized my 1964 Palca notes yesterday — and they seemed

to be far too "extreme" to be true!!! But it is obvious that the situation here above Puno cannot be too different. Possibly identical (if I overlooked very "diffuse" flocks at Palca). Possibly more similar to the situation in those areas of Central Ecuador where highly organized flocks do not occur.

The great question now is: WHY IS THERE SUCH AN EXTREME DIFFERENCE BETWEEN DIFFERENT AREAS WITHIN THE CENTRAL PERUVIAN REGION?

Possibly it can (still) all be explained by factors such as density of vegetation and frontiers.

NOTE: The area worked today is not far from drier region ("and temperate") near the town of Puno itself. The original forest here probably also had an extensive frontier with Puno (mountains here are high). And, of course, as noted above, the area actually is surrounded by cleared land at the present time.

May 28, 1966
Above Puno

Going to work same place as yesterday. Arrive 6:02 a.m.
Clear. Cool.

SEE TODAY'S NOTES ON MIXED DIGLOSSINI
COMMENTS:

It would appear that the social behavior of the birds here is more like that of the birds of Central Ecuador than like that

of the birds near Palca

In this connection, it should be mentioned that the area near Palca, around Saruma, is much more arid than the area around the town of Panao. Thus, one might expect to find more gregariousness here than around Palca.

COMMENT: Working over my Carpus notes, I find that gregariousness here is quite incredibly like gregariousness in the northern part of the Western Cordillera of Colombia.

Central Penn, 1966
Carpenter

May 21, 22, 24, 25, 26

No. Inds Seen Alone

40 ||||
80 ||||
(89) ||||

$$\text{Total} = \begin{array}{r} 236 \\ 89 \\ \hline 325 \end{array}$$

No Inds in Flocks

40 ||||
80 ||||
120 ||||
160 ||||
200 ||||
(236) ||||

No Flocks Seen

26 ||||

No Highly Organized Flocks Seen

16 ||||

Largest No. Inds in one flock

25

Largest No. Species in one flock

17

No. Species in Flock

20 $\left(\begin{array}{cc} 13 & 2 \\ 3 & 12 \\ 4 & (X) \end{array} \right) 917$

317 $\left(\begin{array}{cc} 17 & 5 \end{array} \right)$

46 $\left(\begin{array}{cc} 2 & 2 \\ 4 & (20) 2 \\ 5 & 3 \end{array} \right) 109$

51 $\left(\begin{array}{cc} 7 & 4 \\ 4 & 7 \end{array} \right) 120$

131 $\left(\begin{array}{cc} 5 & 2 \\ 3 & 5 \\ 5 & 9 \end{array} \right) 136$

83 $\left(\begin{array}{cc} 6 \\ (14) & 5 \end{array} \right)$

|||||

13

18 wds

3

4

24

4

6

30

17

25

55

2

3

58

4

6

64

5

6

170

17

14

84

4

17

91

5

17

98

3

4

102

5

6

108

6

9

117

5

17

124

2

4

128

12

18

146

(X)

✓ 25

171

5

✓ 8

179

2

✓ 4

183

2

4

184

3

17

194

4

6

200

7

13

213

2

4

217

5

5

222

9

14

236

183 0670

183
67
250

73.20 %
250 $\sqrt{1830}$
1750
800
750
500

20 $\sqrt{250}$

1.05
19 $\sqrt{20}$
19
100

12.50
20 $\sqrt{250}$
20
50
40
100

1.05 flocks per hour

19
21
11
19
14
66

5.42
19 $\sqrt{103}$
95
80
26
40

~~5.42 sp. per flock~~
5.722 sp. per flock
18 $\sqrt{103}$
90
130
126
40
36
40

9.63 inds per flock
19 $\sqrt{183}$
171
120
114
60

234
89
325

172.62
323 $\sqrt{2360}$
2275
850
650
2000
1950
500

Central Park, 1966

Carpenter

Hours

May 21 5 hrs 30 mins

May 22 4 hrs 45 mins

May 24 4 hrs 30 mins

May 25 5 hrs 00 mins

19 hrs 45 mins

May 26 5 hrs 15 min

25 hrs 00 min

Above Panoas

May 27, 28, 1966
10 hrs 00 min

Inds Alone

Inds in Flocks

(32) |||| |||| |||| |||| |||| |||| |||| ||||
(59) |||| |||| |||| ||||

(17) |||| |||| ||||
(15)

59
15
(64) total

No Rocks Seen
||||

No Highly Organized Flocks
1

Spp per Flock
4
3
2
2
} average =
2.75

Largest No. Inds in One Flock
17

Largest No Spp in one Flock
4

February 8, 1964
Chachapoyas

SEE TODAY'S NOTES ON MIXED DIGLOSSINI

Apart from diglossinis, all I saw today were lots of Andean Sparrows, gold finches, and 2 red-breasted blackbirds. I heard several vocalizations which sounded very much like the TW's of M. bonariensis, but I think that they were actually uttered by the blackbirds.

In general, everything was very quiet.

February 7, 1964
Chachapoyas

Going to work this morning in same area as yesterday afternoon. SEE TODAY'S NOTES ON MIXED DIGLOSSINI.

6:13 a.m. See what seems to be single House Wren alone.

See a pair of Yellow Grosbeaks alone several times.

See a single red-breasted blackbird alone once, in tree which grosbeaks visit from time to time.

7:40. See another single red-breasted blackbird alone, in another

area

9:30 a.m. Finally see a mixed flock of sorts. In area where 2 bright bonariensis seen earlier (see Mixed Diglossini). When first seen group includes at least 1 bright bonariensis, at least 2 (probably more) dull bonariensis, and 1 cyanocephala. All quite close together in area of dense, moderately high scrub (This whole area of scrub is quite extensive. Along stream which eventually develops into a barranca.) Group as a whole quite noisy.

lots of TW's and some twitter. Most of the noise contributed by the Bonariensis is, but the cyanocapala may have added a little. Group as a whole is quite difficult to follow. Keeps appearing and disappearing from sight in scrub. 1 Bonni flies toward the group, lands in scrub about 15-20 ft away, but does not, I think, come much closer (i.e. this Bonni may have been trying to "escort" the group out of its territory). About this time, the cyanocapala seems to disappear. Then, during one of the periods in which the group (now possibly only Bonariensis) is not visible, I catch a brief glimpse of a single bird which may be A. nigrinucha getting thru scrub in exact place where the Bonariensis were earlier and where they reappeared a few seconds later.

When they reappeared, there was no sign of a nigrinucha with them. Then, a few seconds later, see a single CC and a single Bonni quite close to one another and quite close to 1 bright and 1 dull Bonariensis. The Bonni flies off. Then the CC does. Then the 2 Bonariensis also leave. This is the last I see of either the group or the Bonariensis.

A few seconds later see a single cyanocapala in area where flock was earlier. Apparently alone now. Silent. Flies away.

A minute or so later a single Bonni (re-) appears in same area. Flies briefly. Disappears.

ADDITION: There were several apparently hostile pursuits among the Bonariensis in the mixed flock. I shouldn't be surprised if there were 2 family groups involved.

If so, it may help to explain why the mixed flock was formed. The noise and activity involved in the intra-specific dispute may be the reason why the group of Bonariensis was attractive to individuals of other species. (This might be an indication that individuals who do not usually join other species retain the capacity to do so.)

If, on the other hand, mixed flocks are usual here, it must be due to something like the direct or indirect effects of lower altitude (improved climate, etc.). There certainly are no more species of my groups here than near Quito or Jaruma-Palca.

Going to work in same general region this afternoon. Arrive area where mixed flock was seen in morning 4:30 p.m. Windy & cloudy. No birds visible.

Brun

See a single Brun alone 4:41 p.m.

4:55. See a single cyanocephala alone. Probably same individual seen in the morning. Uttering "Seeet" Notes. Flies away.

5:12. What seems to be unmistakably an Orange-bellied Saltator flies by silent and alone.

Incidentally, the altitude of this place now, according to my altimeter is 8075 ft. As the altimeter in the same place read 7650 this morning, something queer must be going on! (I think the area may be around 7800 ft.)

Brun

Then see another single Brun (or the same Brun again) alone.

Brun

Then see a pair of Brun flying about together. One utters (R-tweet) when they land together.

Brun

A few minutes later, see a single Brun alone.

5:54. Definitely see Orange-bellied Saltator in numb. Silent and apparently alone.

Then see a single thrush alone. Apparently same big species as this morning.

A few rain drops 5:50. Starting back to town.

NOTE: It seems obvious that mixed flocks are not usual here, at least in the absence of bonariensis.

Just as I am about to leave, a flock of at least 6 (probably more)

red-breasted blackbirds fly in, first lands in scrub, then moves on to ed-
giant eucalyptus trees, then moves away. Birds apparently alone. Don't
attract any of the local residents of other species during the brief period that
they are here.

Barn

6:17. Get back to CC-Barn-Barn area. ♂ Barn singing
alone from perch on eucalypt leaf. Then see ♀ Barn on eucalypt leaf about 3
ft away. Then a brief chase develops, presumably ♂ chasing ♀. Silent.
Then both birds disappear.

Barn

♂ Barn back singing 6:23. But it is now too dark to see well.

February 10, 1964
Chachapoyas

Went exploring for roads up to higher areas at dawn this morning.
Found some. Don't know how they will work. In any case, too late now
(7:15 a.m.) to start mountain climbing, so will go back to area where mixed
flock seen yesterday. Cloudy. No wind. Warm-ish.

See single red-breasted blackbird alone.

Good news! See a single yellow-bellied seed eater alone!

See a single bright bonariensis with some other bird. Possibly yanacop
hala. Bright bonariensis flies off. The other bird does not, I think, follow.

Barn

See single Barn alone.

See single red breast alone again.

Stopping in 7:35.

CC

There may be a CC singing in grove of Eucalypts. Humble. No other
signs of singing at same time.

Have seen several single thrushes and pairs of thrushes alone. All ap-

presumably same species seen yesterday (LX)

Brum See single Brum alone again

Altitude here according to my altimeter now is 7925!

17:47. C shuts up. Brum sings a few phrases. Then flies away.

Well well! See single adult Brum feeding single juvenile Brum. Rather with adult length wings & tail but complete juvenile plumage. "Begs" by wing Q, with wings spread out horizontally. Accompanied by slight BU, no TV. As far as I could tell, both birds were silent throughout.

aba! 8:00 See single Basileuterus nigrocapitatus alone. Hopping silently thru scrub, where flock was yesterday but where there are no other birds right now. (Identification definite - crown very black.)

Brum Then see single Brum alone again.

SEE TODAY'S NOTES ON MIXED DIGLOSSINI

8:55. See another single Brum alone

See a single red-breast alone again.

See a single ♂ Yellow-green Warbler alone

Leaving 9:02 a.m.

NOTE: If the cyanocephala here really does associate with the Cro-
aracus, the reason may be that it is a single bird. There may be no other cyanocephala around for it to associate with.

This afternoon going to walk up mountain not far from "mixed flock" area. Starting 2:15 p.m. 8075 ft according to my altimeter (which seems to exaggerate in the afternoon)

Cloudy & warm. Not much moving.

Whole area thick wet scrub of varying height in different patches.

2:48. 8550 ft See single cyanocephala. Probably another bird we
saw it, but unseen. Possibly another individual same species

Brown

Can't see what may be *Bryces* in distance
Another up hill see a single Brown alone.

This area looks very much like some of the areas in the Bogota region - surprising, as it is lower in altitude (I think)

Brown
Green
Brown

See same Brown again alone. Feeding on white flowers.

Lots of hummingbirds around here.

3:07. See another single Brown alone 8400 ft.

Reach approximately 9000 ft, the crest of the ridge, 3:25 pm. Path goes along thru dense thicket, taller than my head. Almost impossible to see anything. Warm.

3:31. See a single Black & Blue Tanager feeding in thick scrub, 5 ft above ground. Looks just like Black & Blues seen in north, but I note that this bird has an opalescent green tinge to head & nape. Probably other birds with it. See it again a few minutes later, possibly alone.

3:47. Keep on going further, more or less horizontally. Dead quiet. (Thinking it over, there was really quite a lot of noise near that Black & Blue. Possibly was a mixed flock.)

4:10. See a pair of that montane cotunga (gray with rufous nuchal crest - the one I have seen many places before). Apparently alone.

No red tubular flowers around here.

Up to 9125 ft 4:35. Still quiet as the tomb. Starting down hill.

I certainly don't think that anything much can be breeding around here. Finally see some pink tubular flowers with holes in them.

Still above 9000 ft, see pair montane cotungas alone.

Can

Then, almost same place, 4:57, see single *Diglossa*. Either *coerulea* or (less likely) juvenile some other species. Dull gray blue (quite blue), darker

(3)

above, lighter below. Dark eye. Most of upper mandible black. Lower mandible and gape region upper mandible sort of yellowish flesh. (No expanded "mottle" around gape, however.) Bird quite alone. Eating small pansy-flower-like fruit (biting or jabbing into fruit) in small tree 8-10 ft above ground. Utters occasional loud single "seeeet" notes. Then flies off.

5:00 a.m. See a single cyanocephala a few feet further on. Uttering thinner, weaker "seeeet"s.

5:23. See a single bird which I presume is A. torquatus hopping thru scrub, close to ground, silent and alone. (I presume it is torquatus but the stripe on its head looks quite light, almost whitish.)

Starting down hill from 9000 ft 5:30 p.m.

8445 ft 5:42 Hear what sounds like Tangara Cy singing area thick low scrub. Then shuts up. Then something that sounds like Brewer sings. Then some alternation. With partial overlap. Then no overlap. Then some overlap. Then presumed Cy sings alone. (I am certain as I can be of these identifications.)

See several dark thrushes, without being able to identify them.

Leave 5:15 p.m.

In general, this area has a "biological faces" reminiscent of Colombia and Venezuela. Viz Tangara varnorum and (probably) six species Diglossini. Why? Two possibly significant facts occur to me (1) This area is very close to the Marañon. It is possible that the valley of the Marañon cuts right across the temperate and upper sub-tropical zones. It is possible, therefore, that this is a "frontier" area. (Which would be particularly nice if mixed flocks turn out to be common here!!!) (2) The whole physiography of the area is "cut-up" and "jumbled". Mountains (not very high) and valleys all over the place. Thus, even if this

is not a "frontier" area, in the sense that the temperate and upper sub-tropical zones are completely cut off from similar zones to the north, the patches of temperate and sub-tropical zones around here may be "semi-insular"

February 11, 1964
Chachapoyas.

Going up same mountain again this morning.

Starting out ca 5:13. Partly cloudy. Cold.

Brown
First bird sounds heard ca 5:40. A rather weak and faint Down Chorus in full swing 5:58. Some throat calls, some Brown R. patterns, and a lot of stuff I don't recognize. I am about 1/2 way up the mountain now, and have yet to hear anything very like D.C.

Brown
Some Brown "frontier" type songs 6:02.

See a single Brown singing alone.

6:25. Hear what sounds like A. torquatus in area where Gyis was singing. Obviously alone.

A few minutes later, hear what is obviously song of A. ruficollis or A. schistaceus in adjacent area.

SEE TODAY'S NOTES ON MIXED DIGLOSSINI

Starting up to 7000 ft level 8:00 a.m.

At I start, hear torquatus same place as before.

See a single Tou belly alone. Possibly same individual as before (see diglossini notes). Red patches look quite orange.

Brown
See single Brown alone.

9:45. See 1 or 2 Blacks + Blue Tanagers apparently alone. Slightly

about 9000 ft

COMMENTS: None of my observations yesterday or this morning would suggest that organized mixed flocks are common around here. Even if mixed flocks are more common here than near Quito or in central Peru, this may mean only that the species here are not keeping apart from one another by special methods.

Although both Forficulivora and some Atlapetes of the rufinucha a - schintanus type occur on the mountain ("Tinjaja") here, they both may be relatively rare. Thrushes, by contrast, may be quite common, but they are difficult to see and identify in the very thick scrub here.

Which brings up another point, ... the scrub on Tinjaja is probably thicker, on the average, than at any other place I have ever worked.

Am A peculiar feature of the local avifauna is the relatively low altitude at which many species occur. The Un here is certainly lower than the other subspecies of lofernageri with which I am familiar. The Forficulivora also may be relatively low here. And varrovi ??
Am And the "Coer"s ??

Going to work below Chachapoyas this afternoon. Start way at bottom of barranca leading up to same range of mountains where I worked this morning and yesterday afternoon 7150 ft. 2:50 p.m. Cloudy.

No! Going to try similar barranca a little higher up. 7310 ft. 3:00 p.m. Starts out as region low sparse wet scrub. Bracken

Everything seems quite dead 3:30. No birds of this region certainly do not seem to be active in the afternoons!

Well! 3:35. 7425 ft. See single A. rufinucha alone in relative

by dry & open scrub near upper edge of ravine. Uttering "Tut" Notes. This rufinucha has no trace of mountaineer. Does have white wing patch.

Actually, when I come closer, I find that there are really 2 Actapetes here. One looks just like the rufinucha, but is heavily streaked with blackish or yellow underneath parts! Is this a juvenile rufinucha? Also associated with the bullfinches are 2 Bailetharus. Either nigrocapitatus or (more probably) luteoviridis. Also uttering CN's or AlCN's. 1 Bailetharus is f —————> rufinucha! Then one Brun is attracted by the commotion and joins the group, but apparently doesn't stay long. The actual area where the group is is 7470 ft. Group moves down hill out of sight.

I guess I may presume that mixed flocks do occur here with some degree of slight frequency!

3:33. See single Brun alone.

4:15 Up to 7650 ft. Area of dense but low, obviously young, and moderately humid second growth. Sun has come out and a little wind has started. Still nothing much moving.

God! What a lot of mosquitoes and biting flies there are around here!

Starting downhill 4:23 pm.

Down at base of barranca in single large thicket. Same species as around Chachapoyas still. So far the only species I have been able to see well in this region!

Leave 5:00 pm.

Then work in Bari-Brun area.

See single bright lucanensis alone.

Leaving 6:05

NOTE: I am beginning to think that the occasional occurrence

(11)
ce of mixed flocks in this region is a very good thing for my hypothesis is. I don't see how the mixed flocks here can be explained as anything but adaptations to "frontier" conditions. The region certainly is not wetter all over than the Hono and Palia areas. And not only are there relatively few species here, but there are also relatively few individuals of the species that do associate in mixed flocks.

February 12, 1964
Chaco Páramo

Going to work on Tuija again this morning.

SEE TODAY'S NOTES ON MIXED DIGLOSSINI

7:10. See pair of Cyanocephala, pair of Tirebellus, at least 1 A. rufinucha in same general area of scrub. But not very close together. And the 3 species seem to move off in different directions. (This area is not far from the area of the single "Loer" watched yesterday.)

See single Torquatus alone in same general area a few minutes later. A. torquatus is certainly the overwhelmingly dominant bird-finch in this area. Because the vegetation is so dense?

This afternoon going to work along another road, the road to the airport, slightly above the town.

Brush area scattered low scrub, 8170 ft, 3:15 p.m. Area looks relatively arid, but there is no cactus. Apparently nothing around but some Chaco Sparrows. Lots of wind!

Give up because of wind. Go along another road, the one to Mendoza. Arrive site 7900 ft 4:05 p.m.

Lots of hedge, with agave, some of it in flower, but nothing except

Hummingbirds moving around yet 4:25. Wind is strong here too.
Lots of hummingbirds in Agave Colibri coruscans seems dominant
5:20. See a pair of very light colored thrushes (species unknown) alone
5:30. See a single red breasted blackbird alone.
Leaving 5:35 pm

February 13, 1964
Chachapoyas

Going to work near the town, where I saw the fruit nixed flock
(bonariensis - cyanocephala etc.)

6:21. See a single large pale thrush (presumably TL alone)
Hear what sounds like A. rufinucha song
6:45. See single House Wren alone

SEE TODAY'S NOTES ON MIXED DIGLOSSINI

I am not sure exactly what is the breeding status of many
of the local species. All or most of the diglossini seem to be more or less in
reproductive condition. So may be the bonariensis (they are uttering lots of
TW's) and possibly the cyanocephala (I have heard some "twitters" by
them). But the A. rufinucha do not seem to be very active. Nor the
Joubellies

Northern Peru
Chachapoyas - Hill above town

No. Inds. seen alone

|||||
|||||

(21)

No. Inds. in flocks

||||| (3)

Total = 170

No. flocks seen

|||

No. spp. per flock

2

3

2

No. H.O. flocks seen

Largest No. Inds. one flock

Largest No. spp. one flock

Northern Peru
Chachapoyas - on hill above town

Hours Spent.

Feb. 10 4 hrs 00 min

Feb 11 4 hrs 30 min

Feb. 12 4 hrs 30 min

13 hrs 00 min

Cutervo
June 12, 1966

Arrive town in afternoon. There mixed fog and rain. Altitude of my hotel is 8545 ft according to my altimeter now. It looks as if there is little or no natural vegetation left near the town. But there probably is some second growth scrub.

Go for walk outside town. Reach area mixed second growth & small trees scattered in pasture-like field. And see definite mixed flock. Includes 1 Dryocopus. Obviously juvenile. All dark gray, with definite streaking above & below. Presumably Atty - but looks surprisingly large! Also at least 2 Basileuterus or Hemosporus types (possibly luteoviridis). 1 adult and 1 juv. Juvs. keep and is fed by adult. Also 1 bright bonariensis and 1 verreauxi (either pepper shrike or shrike vireo - which ever one is gray, blue, and yellow, with conspicuous rufous "spectacles"). I shall call this verreauxi "CXXII".

Group as a whole quiet and diffuse. But possibly highly integrated. All birds going same direction. All in trees & scrub ca 20 ft up.

ADDITION: See single Atlapetes torquatus on ground, just below (out of) flock.

NOTE: This area is approximately 8625 ft. I began to observe here ca. 4:20. Saw flock at 4:30 pm.

Then see single Sooty Thrush alone.

4:55 pm. A little further on, region of thick and damp but low scrub. See single M. cyanocephala. Silent. Perched 3 ft up. Definitely alone.

5:14 p.m. See what appears to be PL Atlapetes. 2 ft up in "hedge". Silent. Then see pair Yellowbellies only 1-2 ft away. Apparently this is a mixed flock. But probably not highly organized. Atlapetes disappears. Leaving Yellowbellies apparently alone now.

5:44 p.m. Walking back down road. See another single footy Thrush silent & alone. 10 ft up in tree in "hedge".

5:53. 8650 ft. See single Orange-bellied Saltator alone in "hedge" by road. Silent 3 ft up.

5:54. Down near where first mixed flock seen this afternoon. See single torquatus silent. On ground and 3 ft up in scrub. This is presumably a bird that was with flock earlier, but now it seems to be alone.

Stopping observations 6:05 p.m.

Cutervo,
June 13, 1966

Going to work same place this morning. Somehow I oversleep and don't arrive until 6:30 a.m. Relatively warm. Foggy.

7:01 a.m. 8650 ft. See group 2 or 3 Basileuterus moving thru hedge. 3-5 ft up. Apparently nigrocapitatus Horn. Apparently alone. (There is a Cun near them briefly, but surely this association is either hostile or coincidental.)

A few minutes later, same area, see single Th. cyanocephala 20 ft up in Eucalypt. Then hear northern Cy. Seisurus same tree. NODWAH. Stops. Then cyanocephala sings. NODWAH. Stops. Then the

two species alternate phrases without overlap. Then Cyanocephal shuts up. Cy continues NODWAH

There also is a pair of Cinnamon Woodpeckers (XXIII) in same trees

Probably, the Cy, Cyanocephal, and woodpeckers should be considered to form a loose flock.

Then a single Cinnamon Hummingbird attacks one of the Cinnamon Woodpeckers !!!!!

A few minutes later, slightly down path, see pair of Yellowbellies 4-10 ft up in hedge. At first apparently alone. Then single Diglossa (probably Atter) → Yellowbellies. Then Diglossa flies away. Then I see single Cinn Hummer very near Yellowbellies.

Is Cinnamon Hummingbird allogregarious here now?

7:30. Just a few feet up road. See pair of Cys flying about. Both in hedge and Eucalypts. Apparently followed by pair of Yellowbellies. Obviously same pair seen before. They stick to hedge under Eucalypts. Then single Atter f → Yellowbellies. Then Atter goes up into Eucalypts. I.E. territories of Cy and Atter are at least partly overlapping here. Altho I have yet to see inds. of the 2 species close together here.

Cinnamon Hummingbird and Woodpeckers are still around in general neighborhood.

So perhaps all the birds I have seen so far this morning have been members of the same loose social group !!!!!

Cy(s) sing(s) again and again. All NODWAH. Then shut(s) up. Then I hear some presumed Atter R-Za Za patterns. Then I hear

After

grounded after long NODUWAH. Then they shut up too.

Then I see 2 Orange-bellied Saltators in same small tree as Yellowbellies!!!! Only 3 ft away. One of the saltators is juv. Begs from, and is fed by adult!

Follow path up hill. Scrub gets increasingly low and poor. Looking the further up I go. Finally, 8:30 a.m., 7000 ft, see another mixed flock in distance. Includes 3 Atlapetes tricolor, 1 or 2 Basilinna types, possibly others. All in low thick scrub 2-3 ft up. All quiet. But all close together. Group obviously highly integrated.

Fog has lifted now.

8:44. See single Sooty Thrush fly by alone.

8:57. Just a little bit down road. See group 2 or 3 Atlapetes. Low in low thick scrub. The specific identity of these birds bothers me. Their crowns are definitely rufous in front. Much lighter (yellowish?) behind. And they do have a white wing spot. Could these be rufinucha???. And could they be the same as the birds I identified as tricolor earlier???

Everything dead quiet now.

After

8:425 ft 9:45 a.m. See single Atlapetes apparently alone. 4 ft up in fairly high thick scrub.

US

9:55. Down near where large loose flock seen earlier this morning. See single Cy. 6 ft up hedge. Definitely alone. Silent. Feeding on small red berries. Using same technique as Cy. in Venezuela.

US

Then see single Th. cyanocephalus. Also silent and alone. c. 40 ft up in Eucalypt. 100-150 ft away from Cy.

A few minutes later, see definite mixed flock in scrub 40-

50 ft away. Includes 2-3 Yellowbellies, 2-3 *Atlapetes*. *Atlapetes* apparently *rufinucha*. 1 *Atlapetes* juv. Yellowbellies moving ca - 12 ft up. *Atlapetes* 3-8 ft up. Yellowbellies very noisy. *Atlapetes* moderately so. Group obviously highly integrated. But I can't tell who, if anyone, is leading.

There also is some small bird of another species around in general neighborhood. And a single Sooty Thrush, —————> group. Apparently only briefly.

COMMENTS: Mixed flocks seem to be surprisingly common here in view of the fact that the natural vegetation (which must have been VSTF-15) seems to have been completely destroyed.

This must be correlated with the fact that the area must have had relatively long frontiers with the humid sub-tropical zone. Certainly a good deal of the farmland we passed yesterday, on our way up from Chiclayo, looked quite humid.

NOTE: We also passed large patches of VSTF forest, ca 8500-10,000 ft, near a place called La Montana, not very far from Chiclayo (2-3 hrs). Northernmost Peru must be the most southern part of the tropical Andes where humid forest, in the "temperate" if not the "sub-tropical" zone, still occurs on the western side of the range.

10:45 a.m. See single Cinnamon Wood pecker. Apparently alone. In hedge. 10 ft up. Noisy.

Stopping observations 11:00 a.m.

Going to try country side on other side of town this afternoon. Reach outskirts 8590 ft 1:50 p.m. Cloudy. Windy.

See a single Sooty Thrush alone. In hedge by road.

2:34 pm 8960 ft. See single Atlapetes. Probably rufinucha.
Apparently alone. 2 ft up in extensive area low scrub.

Reach out of ridge. See what looks like real VSTF a few
hundred feet down hill and 1/2 mile away. Not a very large patch,
but quite unmistakable. Nevertheless, I am going to explore scrub
higher up first.

2:46. Not much further on. See single Th. cyanocephala fly by
Silent and alone.

See a tree fern in second growth here.

Then see another single Sooty Thrush alone.

NOTE: There really are quite a lot of birds here. Unfortunately
they are staying hidden most of the time.

Go on down to upper edge forest isolated patch VSTF. 8940 ft
3:32 pm Quite a lot of miscellaneous bird sounds audible. But nothing
visible yet.

3:40. See family Atlapetes. 2 adults, 1 juv. 3-6 ft hedge-like
scrub between fields. Definitely alone. These are the birds which
look rather like tricolor and rufinucha (CXXIV). But I am fairly
certain that they really are pure rufinucha.

3:50. See pair Blue & Yellow tanagers. 20-30 ft up VSTF
trees. Almost certainly Yellowbellies. There may have been another
bird of another species (flycatcher?) with them part of the time.

Then follow narrow path up thru VSTF-scrub. 3:58 pm
8825 ft. See small flock 2 Blue & Blacks, 1 Sooty Thrush (see!).
All 2-3 ft up in scrub under low VSTF trees. All close together
Sooty Thrush | —————> Blue & Blacks

Go on back up to crest of ridge

5:13. See single presumed rufousia (XXIV) low in scrub on one side of road. Also hear tanager (probably Yellowbelly) 20-30 ft away in hedge on other side road. But the 2 birds do not seem to be together. Tanager eventually flies off. Nothing follows.
Stopping observations 5:35 pm

June 14, 1966
Cuteiro

This morning, I am going to work in the same places as yesterday afternoon.

Arrive crest of ridge 5:32 a.m. Dark. Foggy. Light rain. Windy. Everything quiet.

First miscellaneous bird sounds 5:44. Lots of Audubon Sparrow-song by 5:55 a.m. But it is still too dark and foggy to see much at 6:00 a.m.

Quite a lot of bird noises by 6:05 a.m. It also is getting much lighter now.

6:29 a.m. See single Yellowbelly. Apparently alone. In patch of thick, high second growth. Foraging from small tree to small tree. Perching 12-20 ft up. Singing.

Fog is getting thicker now.

See single Sooty Thrush alone.

Birds in general have become noticeably quieter by 6:40.

7:10 a.m. Starting down path to VSTF - even though fog is

still think

Manage to get myself lost in fog! So come on back up to ridge
e. See single Cum (Hummer) alone in scrub of ridge 8:40

Going to try going down hill again

Hear several more Yellowbills on the way. The species is
common here.

8:46. 8760 ft. Hear obvious torquatus song. NODWAH

7:51. A few feet further down. See single Atlapetes XXIV.
Silent and alone. Feeding 3 ft up thick scrub. (NOTE: I still think th
at this is rufinucha. But the back of its crown patch certainly is very
pale — altho much too broad to be pallidimucha.)

A little further down, see single bird perched silent an
d alone. Fog is very thick. So impossible to identify bird definitely.
Probably Th. cyanocapitata.

8:03 a.m. Fog starts to lift, a little, just as I am nearing
VSTF area reached yesterday afternoon (this time, I found the right
+ path!).

See a single Sooty Thrush fly by alone.

8:07. 8670 ft. See single Orange-bellied Saltator alone. 2 ft
up in thick moist scrub (uh!).

It certainly looks as if fog does not encourage the formation
of mixed flocks here!!!

8:25 a.m. 8670 ft. Fog pretty well lifted. See definite mix
ed flock. Includes 2 Blue & Blacks, 1 Bardenerius type. Latter
very noisy. Uttering R's. Sounds like nigrocrinitatus. All birds
close together. 10 ft up in VSTF - scrub, edge pasture

8:30. See another single Sooty Thrush alone.

Then see another Ann Hummer alone.

8:50. Some distance away. See single Yellowbelly 10 ft up in tree edge VSTF and young second growth. There also are lots of hummingbirds in same tree. All Cinnis. Fighting among themselves!!! Cinnis are common here. Then Yellowbelly disappears.

A few moments later, see single M. cyanocephala 20-40 ft away in scrub. Then see pair of Atlapetes XXIV, presumed reafincha, 20-40 ft away in same scrub.

None of these species approaches any other. But the XXIV's and the cyanocephala, at least, are moving roughly parallel.

Then all birds disappear, and area is quite deserted for at least the next 10 minutes. So I think that all these birds (except the Cinnis) should be classified as forming a loose flock.

Am trying to break through 9:10 am

9:12. Some little distance away, see what may be another group of 2 or 3 Atlapetes XXIV. In scrub edge VSTF. Certainly alone (now). Quite noisy. Moving 3-10 ft up.

9:20. Then some other bird, almost certainly another species,

→ the XXIV's.

CORRECTION AND ADDITION: 9:23. Go on a little further 81400 ft. Ahead of path being followed by Atlapetes group. See single CC (definite) feeding in scrub 3-5 ft up. Silent. Feeding white flower heads. Apparently alone. Disappears. But, then, immediately, a single M. cyanocephala, a single Yellowbelly, and a pair of Atlapetes XXIV appear in same general area. Then a see

and Yellowbills also appears. All these birds close together now. Yellowbills and M. cyanocephala ranging 4-10 ft up. Both feeding on same species small red berry. Atlapetes staying low in scrub. I & all my records of Atlapetes, etc. in this particular area, 8090-8400 ft, refer to same birds belonging to single flock. Flock includes 2 Atlapetes, 2 Yellowbills, 1 M. cyanocephala, and (presumably) 1 CC. Flock sometimes very coherent, more often diffuse. But certainly highly integrated.

COMMENT: It is my impression that flocks of this region tend to be diffuse more often than not.

Atlapetes
CC

ADDITION: A single adult Ater (definite) arrives to escort this flock. Feeds tubular red flowers. Silent. CC not visible or audible at the time.

Atlapetes
CC

I & E territories of Ater and CC here are at least adjoining. Probably at least partly overlapping.

Cinn

9:30. Flock still here. Now a Cinn Hummer appears. And attacks M. cyanocephala !!!!!!!

10:00 am. Flock flies down hill. Now I see that there is a second M. cyanocephala with group.

10:05. See single maroon vented montane cotinga alone.

10:10. Area where Basileuterus - Blue & Black flock was seen earlier. See another mixed flock. Includes 2 Atlapetes (low in scrub), 1 M. cyanocephala, 1 Yellowbill, 1 vireonid (same species seen with another flock a couple of days ago), 1 Elaenia type flycatcher. All the latter species in trees. Group obviously highly integrated. First Atlapetes in lead, then M. cyanocephala. All

moderately noisy.

This cannot be same group seen a few minutes earlier. But it certainly looks as if the Atlapetes XXIV - M. cyanocephala - Yellowbilled anouation forms the nucleus of most mixed flocks in this region!!!

A few minutes later, across pasture, region second growth scrub. Near B. nigrocrustatus R's. Also see 1 Atlapetes XXIV, 1 ⁽¹⁴⁾ Elania-like flycatcher, and 2 small flycatchers of a different species (possibly VI). Elania type 10-12 ft up trees. All others low in scrub. This would seem to be another diffuse flock.

10:35 a.m. A little further down. See pair of M. cyanocephala apparently alone 10-20 ft up VSTF trees. Silent.

Then see a single sooty Thrush alone.

Then see pair Orange-bellied Saltators alone 20-25 ft up edge VSTF. Quite noisy.

Go on down to 8500 ft, 10:45 a.m. There is another patch VSTF here. But everything seems fairly quiet.

Then see single M. cyanocephala silent. Apparently alone. 6-12 ft up edge VSTF.

Starting back uphill to ridge 11:10 a.m. Arrive out 11:30. See single Atlapetes XXIV low in thin scrub old field silent. Apparently alone.

Stopping observations 11:45 a.m.

Going to work on opposite side of town (area first visited June 12th). Starting 2:45 p.m. Weather is mixed sun and cloud. Windy.

SEE TODAY'S NOTES ON MIXED DIGLOSSINI

3:25 pm Reach area where large flock seen yesterday morning. Flock certainly not here now.

3:35. Going higher now, following different path from yesterday. Scrub is getting poor and sparse along this path too.

Reaching patches slightly better scrub 7250 ft 4:00 pm. But everything is very quiet. Sun does not reach here, and it is cold and windy.

NOTE: Soil is very sandy all over this mountain. Thus, much of the sparseness of scrub might be due to edaphic factors.

4:12 pm. Reach area which looks rather like impoverished Paríamo de Guasca! 7310 ft.

4:25. See a single Sooty Tern fly by.

Start down hill again 5:00 pm. Reach area where I have worked before 5:20 pm.

5:24 8840 ft. Chin? See a pair of small dark birds — apparently *Altitus* — from low fern scrub. Apparently alone.

A little further down, see single Sooty Tern alone.

Cinn? 5:45. Down where large mixed flock seen yesterday. See another flock. Includes 1 Yellowbelly, 1 Cinn^②, 1 obscure bird which appears to be juv. *Diglossa* (by?), and 1 bird which appears to be *Thlypopsis* (juv!) — the species which is orange underneath except for center of breast. All birds quiet. 10-20 ft up in tree. Group apparently highly integrated.

5:58 pm. A little lower down, region thick low scrub. See 2 *B. microscutatus*. Probably adult and juv. Hear begging noises. Birds apparently alone.

Stopping observations 6:05 pm

NOTE: I am not including my high altitude observations this afternoon in my formal counts of gregariousness. But I am including all the others - and lumping them altogether, simply because the species are essentially similar in all the other areas.

COMMENT: I certainly saw no mixed flocks at the higher altitudes this afternoon. If this is characteristic of the area, it is easily explained. This area is an isolated "patch" of moderately lush scrub. But it is close to Panamá (Punta), and probably always was largely or completely surrounded, on three sides, by very poor sparse scrub (produced by edaphic factors).

June 15, 1966
Cerro

This morning, going to try to reach the higher altitudes reached yesterday afternoon. My departure is delayed by fog.

SEE TODAY'S NOTES ON MIXED DIGLOSSINI

6:20. Just above 9300 ft. Region poor sparse scrub on boulder slide. See pair presumed refinucha (CXXIV). 2 ft up low bushes. Silent. Definitely alone.

6:38. 9375 ft. See a single Atlapetes CXXIV. Uttering "PN"s. Apparently alone. 2 ft up region thick low scrub.

Eventually, go much higher up mountain

8:52 am. 10,075 ft. Area mixed scrub and (AS-VSTF) forest. See pair Yellowbellies 10-12 ft up AS trees. Quiet. Definitely alone.

Going to start down hill, slowly, 9:25 a.m.

10:20 a.m. Quercus-like scrub 9225 ft. See pair *Atlapetes*

XXIV alone. Probably same pair seen earlier.

Reach area down by town where I have worked before 10:40 a.m.

11:00 a.m. Down very close to town. See single *Cinn Woodpecker*

(*Wm*) and single *Cinn Hummingbird* close together, 4 ft up, ledge. Presumably this must be classified as a loose flock. Then hummingbird flies away leaving woodpecker definitely alone.

Stopping observation 11:07 a.m.

COMMENTS: My relatively brief observations of the higher altitude area worked this morning would suggest that it is strictly comparable to the area above Palca. I.E. *Allogr. equans* is 0. (The 2 areas also are similar in other ways. Both are humid, but are surrounded by areas of grassland and/or very poor, sparse scrub. Both are inhabited by impoverished faunas. Altho both faunas include species which are gregarious elsewhere.)

Why is this area inhabited by *Yellowbellies* and (presumably) *rufinucha*, while the Palca area is inhabited by *Greenbellies* and *Atlapetes* ??? (This difference may be nothing more than - another - example of the "random" nature of "competitive success" in the Andes.)

The fact that both *Th. cyanocephala* and mixed flocks are both absent at higher altitudes here might suggest that *cyanocephala* is the "vital ingredient" in other flocks of this region. But I doubt it !!!

Cutervo Jan 1966
Areas where flocks seen.

Hours spent

Jan 12	1 hr 45 min	
Jan 13	4 hrs 30 min	}
	3 hrs 45 min	
Jan 14	5 hrs 00 min	
	1 hr 30 min	}
Jan 15	0 hr 30 min	

17 hrs 00 min

Cutthro Jun. 1966
High altitude area without flocks

Hours Spent

June 14

1 hr 00 min

4 hrs 30 min

5 hrs 30 min

Caterino — June, 1866 12, 13, 14, 15.

Areas where flocks seen

Bo. Birds in flocks

(50) ~~UNT UNT UNT UNT UNT UNT UNT UNT UNT~~
~~UNT UNT UNT II~~

(617)

61.47%

No. Sp. per Flock

5 2

2

8

2

4

2

2

12

13

5

4

4

Cutthroat - June 1966

14/15

High altitude areas without flocks

No. Inds. Seen Alone

No. Inds. in Flocks

III III I

(11)

(0)

Central Ecuador

TOTAL = 36 hrs
(none in mixed
flock areas)
SEE BACK

January 24, 1964
Hono

Arrive 6.05 a.m. Clear. Not too cold

Aters apparently in full song. Other songs audible in background

Pairs of thrushes about

6.11. Hear a few Firebelly "Ja-ah" type vocalizations. Uttered by a single Firebelly. Apparently alone

See what appears to be single Cy, flitting about in Eucalypt. Apparently quite alone

More Firebelly songs

See a single thrush, quite alone

Other songs less common now 6.23. Still some Firebelly songs

See a single C feeding alone in scrub. Possibly utters 1 or 2 song phrases. Does appear almost immediately

6.24. See single Firebelly uttering "Ja-ah" type songs from exposed perch at least 50 ft above ground in Eucalypt. Again - different tree

6.35. See single Dyanne singing 25 ft up in Eucalypt. Presumably by Cy, but looking very dull. Juvenile?? Song phrases preceded by several "Reducting" "Tut" notes. Each phrase itself quite prolonged. Very rapid and twittering. Also moderately soft. Not very much like Ater songs. Also juveniles type?

A few minutes later see what is probably same bird uttering similar songs in adjacent tree. There is also 1 Thraupis bonariensis in same tree. About 20-30 ft away. No reaction between the two birds. Then the bonariensis flies to another tree 50 ft away. Utters several "Tee-wee" phrases. Apparent

ly quite alone. In bright plumage. Male

Most *boranensis* phrases "I see you see you see tree" No other
thing or other additional elements. Uttered while bird perched in tree, expos-
ed, 40 ft above ground. Horizontal posture.

(S) Lots of wren songs now c. 45. Atoms almost or completely silent.
Some blue *Diglossini*, presumably Cys, feeding and singing high in Eucalypts.
6:50. Hear *Dubura* singing in distance.

(S) 6:52. Great decrease in almost all song by now. No *Trichellus*,
Dubura, or *boranensis* song. Some *Diglossini* songs in distance.
See single Atty. Alone. Sings in bush with R-3034. Then feeds
silently. Adult.

Everything very quiet 7:05.

Single thrush flies by

See a single *Attagates nigrifrons* hopping through scrub. Uttering
lots of "Tut" notes. Apparently quite alone.

See a pair of thrushes. Alone

(S) Hear more presumed Cys singing high in Eucalypts. Finally see
one bird. Apparently adult Cy. Sings with introductory "Tut"s. Main body of
phrase high & formless. Apparently overlapping and clutting with another bird
in distance. Latter probably another Cy. Uttering similar formless phrases. Little
or no trace of doublets in songs of either birds. Then the nearby bird flies
over to join distant bird. Now we that they are both Cys. Apparently mates.
No obvious hostility. Hop & fly thru trees & scrubs. Not too close together.
One or both sing(s) from time to time.

(S) I think that my identification of a juvenile Cy earlier this morning
may have been mistaken. The bird may have looked dull because of dull Cy
lit.

More Firebelly "Ja-ah" performances 7:28.

Cy
Ater

Jun

Are the songs of the Cys heard today less like the songs of Ater than were the Cy songs heard here before?? If so, is this because the Ater are not singing? Were the songs of the Cys heard before "contaminated" by Ater songs? In other words, do *Dyglanues* tend to sing whatever other *Dyglanues* songs they hear? By the birds heard in the western Cordillera of Colombia.

" See pair of Firebellies, 1 *Atlapetes torquatus*, 1 Ater all fairly close together. Firebellies fly away. Ater follows. Then Firebellies fly in opposite direction. Ater does not follow. Annotation apparently "accidental".

A few minutes later, 7:40, see pair of *rufinucha* in bush where Firebellies were earlier. But Firebellies apparently gone now *rufinuchas* apparently silent.

See a single *rufinucha*. Supplanted by Thrush. Who then moves on. Thrushes here apparently all blackish, with coral bill, legs, and eye ring.

See pair of Thrushes alone.

Aerial chase involving 2 adult Ater. Silent. Alone.

Then see single Ater alone in Eucalypt.

See single Thrush alone. Another.

See a single Cy singing alone in Eucalypt.

See a pair of Firebellies alone in another Eucalypt 7:55.

Again see single Cy alone. Probably same bird as before.

8:02. See 2 or 3 *Basileuterus* type birds moving thru hedge. General all yellow-olive, with greyish heads (dark streak thru eye?) III

Silent. Apparently alone.

See a single Ater alone.

Ater
Ater

Cy

Cy

Ater

WS

8:30. See single Cy in same patch of scrub as 2 or 3 other birds of another species. Latter not seen well. Possibly the Barbentornis seen here on previous years (Which I shall call "Common Barbentornis"). Noisy. Uttering rattles. But Cy does not follow the other birds when they fly across ravine.

Alex
Alex

Single Alex flies by alone.
Apparent fight between Alex and hummingbird. With R-3 & 4.
Absolutely no trace Alex songs now.
See a single Cy alone.

WS
Alex

See a single Alex alone. (All Alexes seen today have been adult. All references to "Alex" that count throughout these notes will refer to adults. Young birds in immature plumage will be specifically referred to as "juveniles".)
See a pair of Melospiza feeding in thick scrub along ravine. Apparently silent and alone. Apparently feeding on insects 8:45.

There are numerous numbers of many kinds of tubular red flowers here now. Probably more than when I was here on previous years. And the Eucalypts are in bloom.

I wonder why I haven't seen any Megascops today ???

CC

8:55. See pair of A's feeding on Eucalypt flowers 20 ft above ground.
d. After several "Zee... " type song phrases. These do not overlap typical song phrases of single Cy in adjacent tree.

WS

See a single rufinucha alone in low scrub.

Alex

See an apparent pair of adult Alexes moving around together without obvious overt hostility! In scrub. Disappear immediately.

See single rufinucha again. Still alone.

Alex

CORRECTION: It is a pair of rufinuchas.
Hear apparent Alex song 9:14.

Leaving 9.32 a.m.

As far as I could tell today, all or most of the species here were just about as gregarious (or non-gregarious) as during my previous visits here. So I guess that my published accounts are correct '!!'

Although quite a number of species sang this morning, most of them did not sing very strongly or for very long. Obviously not the height of the breeding season for them.

Cy
Aten The only conspicuous exceptions were the *Cys*. These sang at least as much as the *Cys* observed on previous occasions. Possibly breeding. (A difference in breeding seasons might help to explain how the *Cys* and *Atens* manage to co-exist.)

This afternoon working in old Inageto area. Arrive 3.20 p.m. Area very different from a few years ago. Lots of trees cut down. Lots of what was scrub now planted in crops.

Lots of the plain *Catantia* about. Not singing.

Hear a ♂ *bonariensis* uttering twitters. Alone.

Hear some *Catantia* songs in distance.

3.45. Hear TW phrases by *bonariensis* in distance.

Nothing here. Leaving 4.12 p.m.

Arrive Coto Collao 4.35 p.m. Lots of trees cut down here too.

See pair (♂ & ♀) of Blue-crowned Euphonia feeding in low open scrub near grass. Alone. Then 1 *Phrygilus plebejus* ♂ → Blue-crowns. Then 1 Andean Sparrow ♂ →

As far as I can tell, there are neither *Cc*'s nor *Atens* around here.

Cc
Aten
Brun Rather surprising, in some ways, as the general aspect of the area is not unlike that of some of the areas where *Cc*'s and *Brunus* were common near Tarma. But there don't seem to be any tubular red flowers here.

U

It may also be difficult for U to compete with a population of plumbeus as large and dense as the one here ????

NOTE: This time of the year is supposed to be the beginning of the rainy season. But I am told that the rains have not really started yet - or, at least, are much less abundant than usual. Certainly everything looks very dry.

5:20. Hear a single Yellow Greenish Fly by. Alone. Silent.
Leaving 5:25.

January 25, 1964
Atacero

Arrive usual spot 6:25 a.m. (after difficulties). Clear and cold. Little wind.

Laf

Laf singing when I arrive. Song sustained. Usual form of songs. But tone a trifle "thinner". I think that all or most notes have a faint rattle (under tone).

Laf
Ater

6:30. Several other Laf singing in distance. Hear what is probably one Ater song. See single thrush. Alone.

Laf

Diglossine song stopped 6:35. Then hear Laf again. 6:57. See single blue and yellow tanager in thick scrub. Apparently alone. Aha! It is Dubusia. Silent. Hopping about in thick scrub and low trees 5-10 ft above ground.

6:45 Still a small amount of song, primarily by clowstones, thrushes and wrens. But in general it is fairly quiet (just as it was earlier, when I arrived). Obviously not the height of the breeding season here for most

species.

Laf
Laf

A few Lafs still singing
See a single Laf in thick scrub. Alone.
Very quiet 6:55 a.m.

Laf

Then hear Laf(s) singing again. Then Laf(s) stop(s). Then hear
1 or 2 phrases by what is either C or Alter. Then silence again. Then more
Laf song. Apparently uttered by 2 birds close together. Hidden in thick scrub.
Then silence again 7:05.

Laf

Everything dead silent 7:20.
Then a burst of singing by 2 Lafs
See a pair of thrushes. Alone.

Laf
Laf

See a single Laf singing from exposed perch. Quite alone.
See a pair of Lafs engaged in what appears to be a dispute. Alone.
Also see pair rufinucha moving thru thick scrub Laf territory.

Laf

Silent. Laf and rufinucha apparently ignore one another.

7:55. See a pair of rufinucha (possibly same pair as before) moving
silently thru low thick scrub. Silent. Definitely alone.

Laf
alter

See single Laf alone.
See a single Alter singing alone.
See another single thrush alone. The thrush here seems to be the same

species as at Hono.

alter
Laf

See another single Alter singing alone. During part of the time that
it sings, its phrases overlap completely those of a Laf singing far away down
hill.

Laf
alter
C

Lafs still singing occasionally 8:45
See a single Alter alone.
Have C's disappeared from here? Or are they just hidden?

After
After
of Laps
cc

8:52. See single *Atter* along. Then another.
Then see a third single *Atter* supplanted, 3 or 4 times, by a pair.
Without display. *Atter* soon disappears. Laps remain, I think.

Alba 9:10. See single *E. feeding* in scrub. Alone. Utters
own song phrase while other *Pylonomus* are silent.
See a single *rufuncula* alone.
Leaving 9:20.

It seems obvious that organized mixed flocks are quite abundant
here - as usual.

Walking along new highway to Santa Domingo & Guayaquil
this afternoon. Arrive first site 9500 ft, 3:30 p.m. Hedges along road.
Rather dry looking.

Lots of goldfinches!
Otherwise nothing.

Try another site 9300 ft. Scrub along small ravine.
See a single thrush. Alone.

Then a single Whitestart. Alone. Probably same species as at Hono.
Or is it? Rufous crown, bordered black. Large diamond-shaped yellow patch
around eyes. Black streak across cheek reaching bill. Otherwise yellow below.
I shall call this *IV*. Flycatching from tops of low bushes, about 6 ft above
ground. Uttering lots of their high-pitched *W's*. Definitely quite alone.
(CORRECTION: See improved description in list of unidentified species)

Leaving 4:35 p.m.

Another area moderately dry scrub 10,075 ft 4:50.
See a single thrush alone.

Walk a little further along ledge.

5:42. Hear what sounds like *Atter* singing.

After

See another single thrush alone

Hear two birds "Ta-ah" type song in distance

After

See a single Alcedo perched, exposed top of hedge, alone

See a pair of rafanucha hopping thru low dense scrub. Apparently alone. Absolutely silent 6:03 p.m.

Pair of thrushes alone. One of these birds (at least) looked as if it did not have a bright eye ring. (I may also have seen a bird like this at Hono yesterday).

See a single Trachyphaps in bush. Uttering lots of "Tuck" notes, a few PN's. Alone. Flies across field. Not followed

See another single thrush. This one definitely with eye-ring

Leaving 6:23 p.m.

January 26, 1964
Atlix

This morning going to work along road below San Juan, i.e. the old road to Santa Domingo. Clear & moderately cold

Arrive first site 5:50 a.m. According to my altimeter this is 10,750 ft - but I am not sure that the altimeter is working correctly.

Absolutely no dawn song when we arrive

A few thrush alarm calls 5:55.

Various other calls - apparently sub-oscine - a few seconds later.

First real dawn song. Apparently thrush 6:00 a.m.

Then a few more things join in. Nothing like DC yet.

No trace of Diglossine song yet 6:11 a.m.

Dawn chorus dying down 6:13 a.m.

6:15. Hear Fire belly "Ja-ah" song Again & again. "Ja-ah" phrases sometimes preceded by low rattling phrases

See pair ^{WNS} *rupinucha* moving & feeding in dense scrub. Alone.

After

Then see single *After* Alone

They birds certainly are not breeding here!

6:40. Come across a single *Whitstart* *EIV* singing exposed perch, 10 ft above ground. Song sounds very much like the songs of the *Whitstarts* near Unsuavi. Also reminiscent of *Laf*. The bird is quite alone.

See a single *thrush* alone.

Black

Also 6:45. Come across a pair of the common *Hono Pardaliterus* now uttering rattles. There is a pair of *Whitstart* *XIV* near them when I first see them. One of the *Whitstarts* picks up a long string of *u-u-u*. !!! Then the *Pardaliterus* move off in one direction, while the *Whitstarts* move off in the opposite direction. *Whitstarts* j —> *ju-cu-ah* *After* or *Laf*. Two species apparently ignore one another. All this occurs in thick scrub, 5-10 ft above ground. Then the *Whitstarts* disappear. So does *Diglossa*.

C

See a pair of *C*'s feeding in same scrub a few minutes later. Alone. Move on and disappear almost immediately.

7:05. See group of at least 4 ^{WNS} *rupinucha* moving & feeding in bush. C. Close together. And moving together. They all seem to be in adult plumage, but may well be a family group. Lots of R's and then, high "faccaccacc" notes uttered from time to time. Sometimes as "greeting".

C

See a single *C*. Alone.

Leaving 7:15, to go lower.

Move now into 10,700 ft according to my altimeter. Moderately humid scrub area. Still partly in shade.

Laf Hear about sounds like Laf song when I first arrive. Soon shuts up. Then see a whole bunch of little dull colored birds, plus one blue bird, presumably (?) diglossini, moving about more or less together. Can't identify a thing.

Laf Then hear Laf again. Defunct.

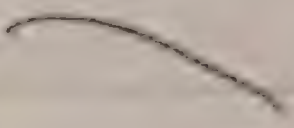
Laf Then see single Laf, feeding alone. Silent.

Laf Then see pair of Laf fly into bush where Catamema is perched. The latter moves away. One of the Laf flies in opposite direction. The Laf left behind begins to sing immediately.

Laf Move on a little further down hill and hear lots of Laf songs in the general neighborhood.

Laf See one Laf singing alone. Exposed in bush 4 ft above ground. Most of song perfectly typical. But also includes loud, moderately long, descending and de-accelerating R's from time to time. There are very Parulenterus like. Usually, but not always, followed by brief pause in song. Could this bird be "unpunctured" or Parulenterus (Homo species) ????

7:55. See another single through. Alone.

Hear what may be rufinucha song  type

Then see a rufinucha bathing in pool. Songs continue - so they must be uttered by another individual.

Undoubtedly, the name of the "Homo Parulenterus" is microcrastus.

8:05. Catch brief glimpse blue Diglossa in flight. Silent. Alone.

Cy Apparently Cy. seems to have black mask.

Laf Laf singing not far away at same time. Then see this singing bird. Defunct, alone.

There are a few Eucalyptus trees scattered among the scrub here. May

Cy
Laf help to explain why Cy come up to "Laf zone" here. Altho the Cy seen
was flying from scrub to scrub at the time.

Everything very quiet now 8:30 a.m.

Laf ADDITION: I forgot to mention that one of the R's uttered
by the singing Laf mentioned above was accompanied by a brief aerial
sally, like a horizontal flycatching flight.

Cy 8:35. Back to area where first saw blue bird (with flock of dull
colored ones). Found Cy singing in tree about 10 ft above ground. Definitely
identified as Cy. Crown not noticeably light, but eye red and with black
facial mask. Song rather interesting. Preceded by 2-4 introductory notes.
Many body of phrases very rapid, formless, twittering, & then. Bird de
finitely alone.

Cy
Laf At first, when the Cy sang, there were no other D. glaucus sing
ing in the same neighborhood. Then a Laf began to sing typical songs.
Songs of two birds overlapped completely for a while. Then both shut
up.

Cy
Laf A few minutes later, the Cy sang a few more phrases while the Laf
remained silent. Then the Cy shut up. Then a different Laf began to
sing in distance. Then the Cy uttered one more phrase, completely overlap
ping the Laf. Then the Cy shut up, the Laf continued singing.

Cy
Laf Cy moves about actively in low scrub, 2-10 ft above ground.
Feeding on cup shaped greenish-white flowers.

Cy
Laf Can't tell if Laf & Cy territories overlap. I think so.

Fog coming in 8:50 a.m.

Single Towhee flies by. Alone.

Then see same bird in tree some minutes later. Still alone.

See another single Towhee alone 7:15 a.m.

Cy

Heard a few bursts of song while other species are silent

Cy
Laf

Cy
Laf

Cy
Laf

It seems possible that mutual inhibition of song between Laf & Cy here, now, is less efficient than the corresponding inhibitions between Laf - Ater - CC and Ater - CC - Cy studied in previous years. If so, this might be due to a variety of factors. It might be a seasonal effect, and/or due to the fact that Laps are becoming used to Cys here (see yesterday's comments on Laf-Ater relations on Atacazo). Or - perhaps more probably - it might be due to the fact that Cys have reached here only recently. (In this connection, it might be mentioned that all the Eucalypts around here seem to be young.) It may also be significant that the type of song uttered by Cys here (high, then, rapid, & forceful) is particularly strongly different from that of the Laps.

NOTE: One of the reasons why the Myioborus & Bantentus observed near Pano never came together is that the former stuck to the trees while the latter stuck to scrub. It is possible that the Myioborus might have joined and/or followed the Bantentus, if the two had ever occurred in the same environment. So it does not necessarily follow that the Myioborus of the Gen to region are fundamentally less gregarious than the Myioborus around La Paz. Possibly the Myioborus seen this morning were really "reacting positively" to the Bantentus. The environment here is the kind where one might expect such reactions to occur - if ever.

Laf

Saw a single Laf, alone, in area very near where Cy occurred

Cy
Ater
CC

Rather surprisingly, I have not seen a single Ater or CC near the areas where Cys were seen (altho both Ater & CC's certainly occur up hill). It looks almost as if Cys replace Ater & CC's in this particular (small) area.

Laf

7:50. One Laf singing while other species are silent. Perfectly typical song. No trace of R's. (This is certainly not the same bird that uttered R's earlier this morning.)

Leaving 10:15

This afternoon working along path above floor. Arrive 3:40. Clear and fairly warm. Some cloud apparently coming in, in distance

Almost nothing moving now

4:12. See single thrush alone. See same bird again, still alone, a few minutes later.

4:25. See a single rupicola alone in low scrub

Fog coming in 4:32

Leave and go down to outskirts of town itself. Arrive 5:03 p.m.

Driving down, the car flushed 6 or 7 thrushes from a small stretch of bush. Looked almost as if they had been in a flock!

Raining gently 5:07.

Everything is unbelievably quiet here this afternoon!

See a single thrush fly by. Silent and alone

A pair of thrushes fly by. Silent and alone

See a single individual of what appears to be Basileuterus inprocris atru hopping thru bush. Silent and alone

See another single thrush fly by

Leaving 6:00 p.m.

January 27, 1964
Hono

Arrive by village early 5:52 a.m. Still too dark to see anything. Looks as if it is going to be another clear day! (What has happened to the rainy season here ???)

No singing yet.

First songs (probably thrushes) 5:36.

After First diglossine songs 6:02. Almost entirely Ater. First few songs have pronounced R components - usually subterminal. Later phrases (after first 4 or 5) lack the R.

6:06. Hear first Atlapetes torquatus song. Single high pitched, rather plaintive, long whistles, repeated quite rapidly one right after the other. "seeeewoo seeeewoo seeeewoo" (The notes are not really pronouncedly bisyllabic, but they are definitely lower toward the end than at the beginning.) This song is coming from almost or exactly the same site where I heard torquatus song a few years ago.

After 6:12 a.m. Ater in scrub. Then Ater stops. Then a Cy sings phrase after phrase. All quite then and formless. Preceded by approximately 4, accelerating, preliminary notes.

"Tut tut tut tut tut tut" (End of each phrase possibly something like "Eegoo") Then Cy falls silent.

So it looks as if the Ater-Cy inhibition were still working!

6:14 Hear first Towhee song in distance.

After 6:18 Ater singing again. Overlapping Towhee. But Cy is silent. Then Ater shut up again.

See single Thrush perched alone.

6:20. Hear what may be Basileuterus nigrocrustatus song.

Dawn Chorus definitely weaker by 6:25 a.m.

See a single White-throat LIV (melanocorypha) in scrub. Silent and alone.

See a single Thrush fly by, alone.

6:30. See a single Thryothorus. Apparently alone. In thick scrub.

11
s 10. See a single *C. maculosa* still feeding energetically in scrub.
Quite noisy. Uttering loud "CN"s, probably also rattling "songs". When
first seen, there was a *Whistler* ^{IV} in same patch of scrub, about 10-
12 ft away from the *Primitives*. Also feeding, in typical fashion.
Both birds continue feeding for some minutes. In same general area, the
Whistler leaping and uttering with some appreciable frequency. There
is a second *Whistler*, same species, in bush 20-30 ft away. It shows
no tendency to approach the other two birds. Jumps from time to time. Then
the *Primitives* flies 30-40 ft away (into similar looking scrub). Another
Whistler follows.

Hear first *Dybbana* song 6:43 a.m.

After

See single *After* singing alone. No other *Dybbana* audible at
same time.

See single *Whistler* singing alone (probably same bird seen sing-
ing earlier).

as
CC

Come across *Cy* singing in tree. Its song phrases overlap completely
with songs of 1 or 2 CC's singing in trees and scrub about 100 ft
away. Then *Cy* shuts up. 1 CC utters a few more song phrases. Then
shuts up. Then the *Cy* utters 1 more phrase. Then shuts up. 7:05

CC
CC
CC

Now (or then) CC(s) definitely quite alone

So it looks as if the *Cy*-CC inhibition has broken down per-
manently.

gen
CC

It is interesting that these breakdowns occur when at least one
of the species involved is singing much less frequently than during the height of
the breeding season. (I suppose that mutual inhibition of song is "necessary"
at the height of the breeding season, but not "necessary" now.)

It is impossible to determine which species is responsible for the

breakdown of the mutual inhibition when overlaps of song occur.

CC
Cy out 17:10. Another outburst of song by CC's. Cy quite silent throughout.

Cy It may be significant that the species which seems to be overlapped most frequently in this region now, Cy, is the one which is rarest in the regions of Peru and Bolivia where I have worked.

Cy 17:16. See a single Yellow Grosbeak alone.
gung. See 2 Cys flitting about in bushes and trees. One or both birds singing. No other diglossines audible at same time. No other birds near the Cys.

ater See single ater alone.
See single Firebelly alone.
Cy Singing Cy singing alone. Then CC in distance starts to sing. Complete overlap. Then 2 birds alternate songs. Then continue for some minutes, sometimes alternating, sometimes partially overlapping. Then both fall silent. Then Cy sing alone again.

CC CC
Cy Cy
ater Cy
Cy This looked almost as if the CC were singing in response to the Cy.
There are certainly Ateris in the same general neighborhood as the Cys and CC's here. But they have remained silent, or uttered only R-Zongs while the latter species have sung.

CC Cy (s) start (s) to sing again. Again this seems to stimulate the CC (s). Partial overlaps and alternation.

ater 17:30. See an apparent pair of Ateris alone.
CC CC singing while other diglossines are silent. Then another CC begins to sing, in tree about 40 ft away. Complete overlap song of the 2 individuals. Then the second bird flies over to first. Supplants first so

oral tracts. Brief vocalizations. Between supplants, the less aggressive individual is in "fluffed, hunched" posture common to

CC



(I wasn't close enough to see if crown was ruffled or not.)

CC

See a single Cy alone and silent in hedge

CC

7:42. A single *Swainson's* flies into a bush where there is a blue *Dryas* (juv. Cy ???). Lands about 10 ft away. No apparent reaction between the 2 birds. Then both fly off in different directions

CC

See a pair of CC's moving through scrub, feeding by probing in or at small white flowers. Alone. One or both sing occasionally.

CC

All the CC songs heard in the Quito region this trip have been twitts. No triplets. Now very distinctly divided into "Zee wee"s

Ator

See single Ator feeding alone.

See pair of *Swainson's* feeding alone.

Ator

See an adult and a juvenile (definite!) Ator feeding together on red tubular flowers in scrub. No other species nearby.

CC

8:02 am. See same pair of CC as before. Still feeding alone. Silent

CC

See single Cy alone.

Ator

See single Ator alone.

Ator

See adult and juvenile Ator feeding together again. Again no other species nearby.

Ator

See another Ator alone.

CC

See another Cy alone.

See another *Swainson's* alone.

✓
 See a pair of B. nigrocrinitatus engaged in dispute. Very noisy. Utter-
 ing SHN's, "long Rattles", and HN's (see today's notes on Panloupentus)
 Quite alone.

✓
 See a Cy alone again.

See another single Cy alone again.

Cy 8:52. Come across a Cy singing (probably one of the birds heard
 earlier this morning). No other deglomus audible.

Atter See a single Atter alone.

Cy See a single Cy feeding alone on flowers of Eucalypt. Then twice
Scam attacks hummingbird (possibly Colibri coruscans). Sing's (without intr-
 oductory notes) after attack.

✓
 See another single Scambell alone.

See another single Atter alone.

Leaving 9:10 a.m.

As a result of my observations in the Quito region, it is obvious
 that some of the species observed near Induavi, Bolivia, were really show-
 ing more than the "bare minimum" of inter-specific gregariousness. It is
 possible that some of the differences in inter-specific gregariousness between
 populations of the same species here and in Bolivia are due to the fact that
 there are more flocks of a single species in Bolivia than here (i.e. that there are
 more "attractions" in Bolivia than here). But not all these differences can
 be explained in this way. The A. rufinucha here, for instance, do really
 seem to be less attracted to individuals of other species than the A. rufin-
 ucha near Induavi. There probably are similar differences between the
 populations of Scambell in the two areas. Possibly the same is true of
 the populations of M. melanocephalus and B. nigrocrinitatus.

70

This afternoon working in area along new highway to Santo Domingo and Juncagual. Same place as day before yesterday in afternoon. 16 KM from Gento.

Arrive 4:45 p.m. Everything very quiet.

CC See a single CC. alone

See a single thrush alone. Again Again Again

More and more single thrushes and pairs alone. I will stop counting them now).

5:20. See a single rufinucha alone & in seat

See a single N. American warbler (possibly Bay Breast or Black poll alone

Another single rufinucha flies by. Definitely alone
Leaving 6:17.

January 28, 1964
Atacaso

Going to work at old spot, above San Juan, this morning.

Arrive 5:45 a.m. Cold & clear. Still dark.

Dawn chorus not started yet.

First sounds — thrush — heard 5:55 a.m.

6:12 a.m. There has been almost nothing in the way of a dawn chorus so far. A few thrushes & claustrates uttering a few sounds — not necessarily song

Almost dead quiet 6:25 a.m.

6:31. See pair of rufinucha in seat. Feeding on the same yellow-greenish-white flowers (with red calyxes) favoured by Diglossas!!!! Apparent

ly looking for nectar !!! Certainly probing into holes (presumably made by
Diplosas) already present in flowers. Once one bird bites off whole flower and
"nibbles" it. Both birds quite silent, and definitely alone.

6:45. See another single rufinucha alone.

7:02. Come across single A. torquatus in dense scrub. Hops closer
to look at me. Quite silent. With extreme CR, at least moderate Hflff, and
very extreme Belly-fluffing. Does a little irregular Bowing, a few whistle
Lab lateral TF's. Then a Laf appears. Silent. Comes closer to me and even
closer to the torquatus (2 birds only 3 ft apart at one point). Laf appar-
ed to be curious about me and/or the torquatus. When the torquatus gradu-
ally moves off in one direction. The Laf flies in another direction.

7:14. See another single rufinucha alone.

7:50. Have seen several single thrushes alone here this morning.
All quite similar in appearance — but I am now becoming convinced that
there are at least 2 species involved. The last bird seen definitely did not
have an eye ring.

8:05. Come across pair of torquatus in scrub. Hidden but probably
alone. Utter quibble "seeeoooo" and "Whik-seeeoooo" notes. High
whistles, but with a definite hoarse quality. Certainly much hoarser than
notes heard yesterday.

Come across same birds again a few minutes later. Utter lots of hoarse
"seeeoooo"s.

8:15. See a pair of thrushes alone. Without eye ring.

See a single rufinucha alone.

Lab See a single Laf alone.

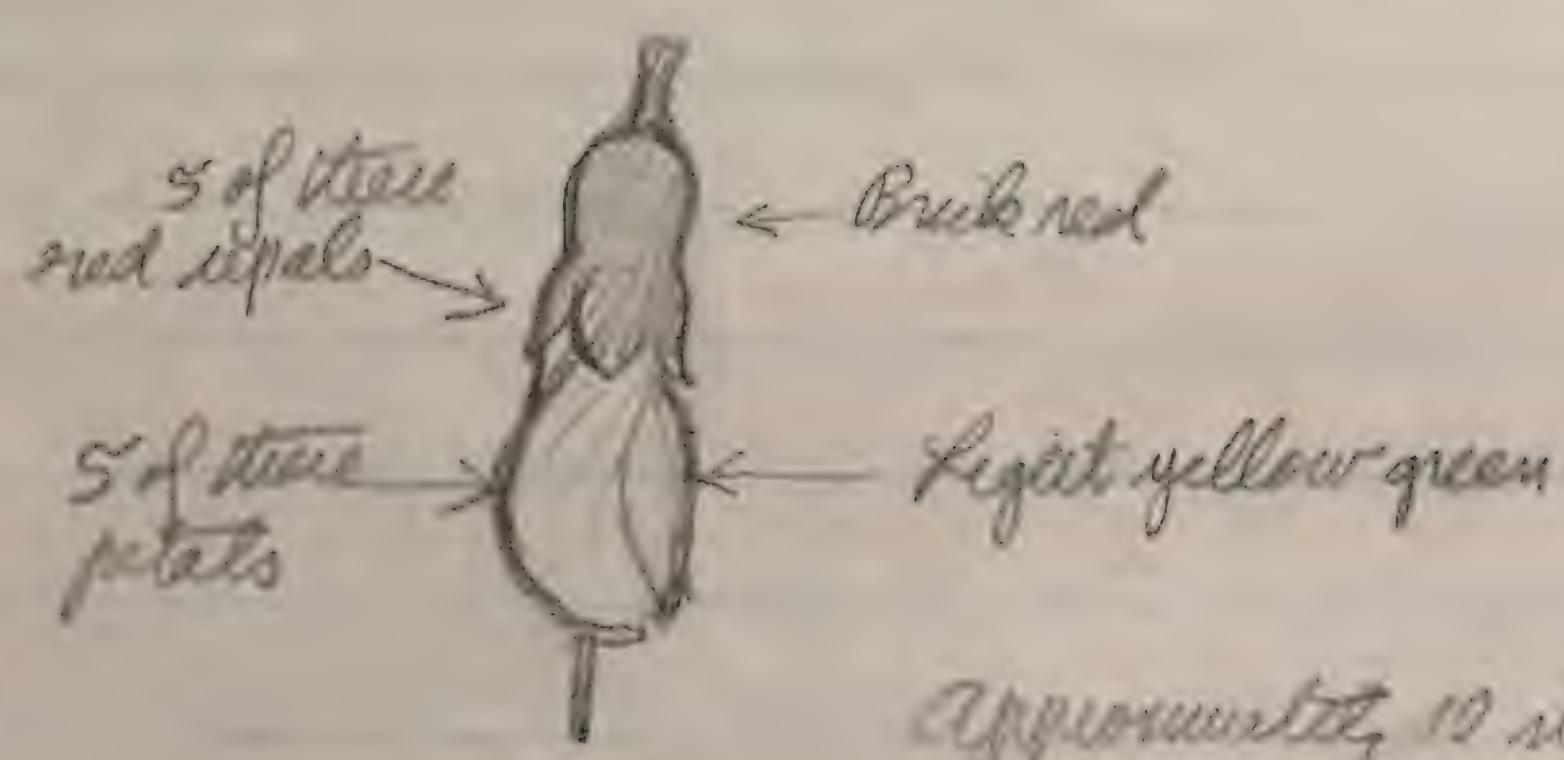
8:22. See another single thrush without eye ring. Is this the only
species up here ???

8 34 See single rufinucha feeding on red & white flowers. Probably same bird was feeding on same flowers earlier. Definitely making holes (by rubbing) in sides of flowers. Also occasionally picks off white part of flower, holds it in bill, and rubbles it as a whole. Quite silent. Quite alone.

Flowers on small to medium sized bushes 4-8 ft high. With lots of small green leaves



Complete flower comes in



Approximately 10 shorter stamens around central pistil

The rufinucha consistently made its holes near the base of the petals. Some of the flowers investigated had dead insects inside.

7:00 a.m. see 2 thrushes together. One definitely with orange yell on eye ring, one definitely without. Otherwise birds appear to be identical Same size, shape, & color of plumage, bill, & feet. I think that they must be the same species. Possibly differ in age and/or sex.

Feb
After

These birds were in the same patch of scrub as two Lafs and 1 Atter. But the thrushes and honeycreepers seemed to ignore one another.

(3)

Leaving 9:20.

Gen NOTE: There is no doubt but that the faunas above and below
San Juan are strikingly different from one another. The lower fauna
is quite reminiscent of San Juan in some ways (i.e. the presence of Baileuter
cy and Hypobor as well as Cy). The difference between the two faunas
seems to be rather large to be explained by altitude alone. It may be equ-
ally significant that the lower area receives the sun immediately in the
morning while most of the upper area does not.

This afternoon going to work in a place called Pomayui —
where I saw the Atlapetes uniopterus years ago. Arrive 4:04 p.m.
Warm & clear

Can hear a number of bonariensis around
for a single Yellow Grackle & alone.

See a single bonariensis alone. In flight. Also perched, uttering

TW Notes 4:33 p.m.

CC See a single CC. Silent and alone

See another CC. Apparently single & alone. Utters "secret" Notes

CC in flight. Sings in bunch. Utters brief high Trill or R on landing. Then
flies on again.

5:04 See a pair of bonariensis (bright and dull) fly by. Alone

CC 5:30. See a single CC in willow. Since supplanted by Audubon
Sparrow

Leaving 6:00 p.m.

January 27, 1964
Atacaso

Going to work below San Juan today. Same place where Cys were seen a few days ago. Arrive 5:42 a.m. Dark and cold. Everything quite silent.

NOTE: Although I am calling this area "Atacaso" — because it is so close to the area on Atacaso where I have worked before — it is probably actually a full bell of Pislincha.

First bird sounds — thrushes in distance — heard 5:53 a.m. 6:00 a.m. Still dark. Something uttering "treet treet treet treet treet treet..." quite regularly. DC? Stops 6:05 (when thrush starts to sing loudly nearby).

6:06. Can hear refincha song. No R component.

6:07. Near Thrush "Ja-ah" song. Also PN's. Some "Ja-ah" phrases preceded by brief R phrases.

6:12. Quite a lot of refincha song.

Probably also torquatus in distance.

Strong wind coming up 6:15.

6:17 See single Thrush uttering "Ja-ah" song. Alone. Exposed bird perch in tree.

Songs gradually stopping 6:23. Still haven't heard anything definitely deglomine.

6:30. See single Thrush alone. And another.

6:38. See pair of refincha. Followed by a Laf for a second or so. But then Laf turns away and goes in another direction. refincha quite noisy.

Laf

6:47. See a single torquatus alone.

Everything quiet now 6:53

See a single Laf alone

See a single Laf and a pair of rufinucha feeding in same buds. rufinucha apparently looking for insects. Laf soon disappears. rufinucha remain

7:26. See another pair of rufinucha alone

7:30 Hear Dabura in distance

7:58. See a single Fire belly alone.

Going to walk down road.

Unbelievably still 8:17 a.m.

See a couple of Fire bellies alone. Again.

8:40 See a single Laf and a single Fire belly feeding only a foot or so apart. Both silent. Laf flies off. Fire belly does not follow.

Leaving 9:10.

This afternoon, working along path above Hono. SEE TODAY'S

NOTES ON MIXED DIGLOSSINI

4:20 p.m. See an Atia alone. Then another.

Then see a single Fire belly alone.

Then see pair of A. rufinucha alone & silent

4:44. A pair of Fire bellies lands in a tree, where a cyanocephala is already perched. One of the Fire bellies twice supplants and chases the cyanocephala. The attacks are accompanied by brief "rattling rasps" (almost certainly uttered by the Fire belly). The Fire bellies around here certainly don't appear to be "friendly."

Leaving 5:00 p.m.

January 30, 1964
Hono

Going to work along path above Hono this morning. Arrive
very early, 5:30 a.m. Clear

Hear first ocean sounds — nondescript — 5:55 a.m.

Dawn Chorus in full swing 6:02. Largely Thrush

Lots of single thrushes around (I will not enumerate them in
detail unless there is something particularly interesting about them.)

6:15 Hear first refranchia song. No R component.

Everything very quiet now 6:30

6:35. Hear first fruibilly songs "Ja-ah" accelerating into
rattles (loud rattles, possibly not the same as the rattles preceding some
"Ja-ah" phrases)

Several views of Ater ^{WJ} alone.

See a single fruibilly singing alone.

6:42. See a single refranchia alone.

7:01. See a single Cy alone. Then see another fruibilly alone.

See another single Ater singing alone.

See a single Cy feeding on flowers of Eucalypt. Several hummingbirds

near by, but the different species seem to be ignoring one another.

8:42 a.m. During most of the last hour and a half, I have been

concentrating on reactions between Cy and Ater (SEE TODAY'S NOTES ON
MIXED DIGLOSSINI). In the course of this — out of the corners of my eye

— I have seen an appreciable number (4 or 5) of both refranchia and fruibilly
billies. Always alone.

8:46. See a single torquatus alone.

(27)

Leaving 9:15.

GENERAL REMARKS: I have been both pleased and somewhat surprised to find the tanager and finches here behaving now in the same way as on previous visits.

Mixed flocks are so rare here that the different species may be avoiding one another because of special aversions.

SUM TOTAL ALL OBSERVATIONS = 36 hrs 00 min

Observations in and around Quito,
and in cleared or agricultural areas
(i.e. where mixed flocks would not
be expected to occur) = 8 hrs 00 min

Time spent in areas which
looked suitable for flocks = 28 hrs 00 min

Time spent in areas in
which highly organized flocks
are known to occur = 0 hrs 00 min

Jan. 24, 25, 26, 27, 28, 29, 30

Inds Alone

(239) + 134

Inds in Flocks

|||||
|||

(30) + 16

No. Flocks

|||||

(11) + 5

Species in flocks

2
2
3
2
2
2
2
2
2
2
2

(23)

No. Organized Flocks

(0)

Largest No. Inds in Flocks

(4)

3
2
2
2
2
2

Central Ecuador

78

TOTAL = 87 hrs 15 min

March 5, 1966
Road to Papallacta
(East of Quito)

Get lost on way! But eventually pass Pifo, go over crest of range (paramo) and start descent. Reach first patch of AS, in ravine, 7:25 a.m. / 12,400 ft. Vegetation is not very lush. No obvious flowers.

Shy partly cloudy. Little wind.

Everything very quiet.

See several Sooty Thrushes alone.

Going further down 7:37. Reach another patch AS 7:43. Some AS apparently mature. Other part second growth 12,050 ft. A few bird sounds audible.

See some *Catamnia*-type finches alone. 3-4 ft up in scrub. There are some red tubular flowers around here.

Also see some of the big, uncolored, *Phryganeus* alone.

Everything very quiet (again) 7:55. Apparently, this is not the breeding season.

Another single Sooty Thrush alone.

Aha!!! 8:00 a.m. Slightly down road. Region of slightly denser and taller AS. See definite mixed flock!!! Includes 2 or 3 CC's (probably largely grey on breast). And 2 or 3 larger black and white birds. Apparently *Urothraupis*!!! Birds quite close together (usually within 3-6 ft of one another) And stay together at least 5 minutes. Once Black and White f → CC. I see CC, CC f → Black and White. All birds very quiet. Only

occasional CN's All birds apparently picking insects off leaves. A's also probing in dead flower heads. All birds ranging 2 1/2 - 8 ft above ground.

Group gradually disappears — without my being able to see where it went. Probably up hill.

8:27. Going back up road. Catch brief glimpse of single hummingbird which may be *Aglaioceros*. Alone.

Then see a single *Finchella*. Silent and alone.

Leaving 8:34

See another area 11,250 ft 8:48. Area of scrub scattered in pasture. Quiet.

8:50. Hear what may be Laf or warbler song in distance. Then see more single Sooty Thrushes alone. Then more Laf-type songs. NODWA.

Then catch glimpse single White-bearded Flycatcher. Silent. 2 ft up in dead scrub. Probably alone. But there are some small birds (unidentified) in scrub, not too far away across road.

Everything is very skulking around here now!

I can hear some *Rallie-flourishes* which sound like *Basileuterus nigrocrissatus*, but I can't see the birds.

Another single Sooty Thrush alone 9:13 a.m.

Leaving 9:23 a.m.

9:30. Down by Laguna de Papallacta. 10,800 ft. More scrub intermingled with pasture.

Hear more Laf-like songs. NODWA. Then see birds uttering them. Two *Whistlants*. Usual species for the region (*Melanocorypha*). Rufous-crowns. Yellow spectacles. Sound exactly

like the "Whitetailed" etc. from Northern Andes. Obviously same species. Flitting from bush to bush across pasture. 2-20 ft up. Certainly alone part of the time. But there are some other birds in same general area. Andean Sparrows, little flycatchers with recurved beaks, a green hummer, etc. And some of these other birds do fly into same bushes as the Whitetails. But this might be "coincidence".

9:45. A little further along road. See single B. Myiozetetes ater. 6-10 ft up in bush. Uttering loud "Tut" notes. Definitely alone.

Further along road, hear more Whitetail song. NODWA. Then see single Whitetail fly from tree to tree. Apparently alone.

Then see green hummingbird (like VIII on Paracé) feeding in bushes 3 ft up. Alone. Then see single rufous hummingbird (XVI) feeding on red and white flowers 20 ft away. I think I have seen Agelaius feeding on same species of flower before. Then XVI flies away. Then I hear a few Atter song phrases (with R) nearby, without being able to see the bird.

Leaving 10:15 a.m.

COMMENTS: The vegetation of the areas visited today does not look very, very humid. Doesn't look as humid as the vegetation of some parts of Atacazo and Pichincha. But this appearance may be somewhat misleading. The whole region has been greatly affected by human activities. Both cutting of trees and grazing of cattle.

In general, this area looks rather like Paracé - La Higuera in the Sierra de Mucucha and the drier side of Paracé in the

Central Cordillera of Colombia

I was struck, however, by the apparently extreme rarity of birds here this morning. This is probably another example of appearances being deceptive. Probably the birds were only hidden.

March 6, 1966
Laguna de Papallacta

Going to start work in the last place visited yesterday.
Arrive 6:25 a.m. Cloudy. Cool.

See plenty of single sooty Thrushes alone along road down here.

Everything very quiet in general, except for miscellaneous Thrush notes (not songs).

6:27. More single Sooty Thrushes alone. Also some wren songs. (This might conceivably be the same species that uttered Diglossa-like songs on Purace.)

Wren shuts up. Then hear presumed *Atter* songs in distance. NODWA. Then *Atter* shuts up. A little further along hear more Diglossa song. Cy? NODWA. Bird shuts up. Hear brief whistle. Whites tail song. NODWA. Whitetail shuts up.

6:33. See single C. Silent and alone. Feeding 2 ft up in bush in pasture.

Then see single *Atlapetes pallidiviridis* (definite) !!! 6"-2' up in scrub along road. Uttering CN's. Also definitely alone.

6:42. Various small hummingbirds fighting among themselves.

Then some more Diglossa-like twitters in distance. NODWA

Then some Atlapetes-type Whistle songs. NODWA

Then more Whitestart songs. NODWA

Lots more hummingbirds fighting

6:49. See single Whitestart alone. Silent. Feeding 12 ft up in tree. In usual way. Then, 20 ft down road, see another. Perched 12 ft up. Singing. NODWA. Alone. Shuts up. Flies off.

See pair of Fribellies flying from tree to tree. Singing occasionally. Definitely alone

Then more Whitestart song in distance. NODWA. Shuts up.

Then Laf begins to sing. Perched exposed 3 ft up in bush above lake. NODWA. Definitely alone Shuts up.

Immediately, Whitestart begins to sing again. NODWA. Two Whitestarts moving thru bushes (30 ft away from where Laf sang) 6 ft up. Definitely alone.

Whitestarts shut up. And Laf sings in distance!

7:08. Further down road. Laf sings. NODWA. Shuts up. Whitestart sings. NODWA.

More Sooty Thrushes alone

Then see pair Fribellies. Low in bushes of sparse second growth scrub. Laf appears in bush. 20-30 ft away. One Fribelly
→ Laf! Laf flies away immediately. Fribelly does not follow.

SEE ALSO TODAY'S NOTES ON MIXED DIGLOSSINI

8:00 a.m. Everything quiet now.

8:11 Laf singing again. NODWA.

Then see a single Firebelly fly by. Silent and alone.

8:22. Walking along path above road. See pair of CC's feeding in bushes, 2-6 ft up. Apparently alone. Twice one supplants the other. Silent both times.

A few minutes later, see single White bearded Flycatcher in one of the bushes visited by CC's earlier. Silent. Apparently alone. Then see 1 White bearded chasing another. Both fly away. Nothing follows.

There is a small flock of Catamania-type finches (♂'s with light bills, dark on face, otherwise gray except for rufous under tail) moving along edge of scrub here. Nothing else seems to be paying any attention to them.

I can hear a lot of Basileuterus-type Rattle-flourishes around here. (As usual) without being able to see the birds.

8:41. Again see pair of CC's. Silent and alone.

8:47. Larks still singing occasionally. NODWA

Leaving here 9:00 a.m.

Go on down to another site 10,425 ft. Some miscellaneous scrub here.

Hear Atlapetes "Greetings." Also Basileuterus Rattle-flourishes. Not overlapping.

9:12. A little further down road, 10,400 ft. Hear Atlapetes type whistles and Whitethroats song coming from same patch second growth scrub. Then both species shut up. Then see pair CC's other side of road. Utter Twitters. NODWA. Then they fly in general direction of scrub where Atlapetes & Whitethroats were heard earlier. Disappear.

U This may have been a diffuse flock. If so, it's were following
A few minutes later, see single Whitetail feeding in same
scrub. 6 ft up. Silent. And now apparently alone.

A few ft further on, see single warbler crested montane cat
wren down hill. Definitely alone.

9:45 a.m. Follow side path down hill. Only a few yards be
low road, come across definite mixed flock. In region of very mixed
tall scrub and woods. Very lush. Large second growth. With some
probably mature AS trees mixed in. Flock includes 2 Whitestrupes,
1 Whitetail, 2 Firebellies. Quite diffuse. Birds moderately noisy.
Whitestrupes and Whitetail ranging 5-20 ft up. Firebellies rang-
ing 15-20 ft up. Can't tell who, if anyone, is leading.

NOTE: This vegetation looks as if it should occur 1000 ft low-
er than it actually does.

Firebellies fly far away. 9:55. Nothing else follows.
Whitestrupes and Whitetail gradually move up hill. Staying
close together. Whitetail probably following — Whitestrupes.
Leaving 10:00 a.m.

March 17, 1966
Road to Papallacta

Going to work below the lake today, just above the town
of Papallacta itself. I.E. The same area where I worked just
before 10:00 a.m. yesterday.

Arrive 6:12 a.m. Just getting light. Cloudy. Cool. Every-
thing very quiet.

Hear first White-tail Song phrase 6:17 a.m.
Then another. Apparently White-tail NODWA. Then a whole series
of phrases. Still NODWA. Then White-tail Songs alternate with
Brachyotus-type Rattle-flourishes 6:21. Then both species
shut up.

Hear what sounds like incomplete Atlapetes Whistle Songs
(only 2 notes per phrase) 6:22. NODWA. Atlapetes shuts up, White-
tail starts again. NODWA. Then Atlapetes starts again. Several
complete overlaps with White-tail songs. But the finch and the Wh-
ite-tail are at least 100 ft apart at the time.

White-tail shuts up. Presumed Atlapetes continues. NODWA
6:26. A little further up road, hear 3 note songs which
probably also are Atlapetes. Also NODWA. (This does not so
und like the rufinucha songs I remember. Just 2 notes of each
phrase and with conspicuous "snaps". Is this pallidimucha?)

See a single Sooty Thrush alone.

See a single B. microcratus alone. 2 ft up in second gr
rowth scrub edge road.

Presumed Atlapetes has shut up now. And then I hear
Twitter up hill! NODWA. Sound like Cy phrases without Intro
Notes! Then bird shuts up.

6:40. See single Dubusia. Silent. Definitely alone.
2 ft up in second growth scrub. Flies away immediately.

Twitter up road, hear more White-tail Song. NODWA.
Then Rattle-flourish. Complete overlap. White-tail shuts up.
Rattle-flourishes continue. Shut up. White-tail begins again.
NODWA. This is almost exactly same place where Whitestrife - White

start - Jubberly flock was seen yesterday! I wouldn't be surprised if this is partly same group here now.

Aha! See pair Jubberlies 10-12 ft up in scrub. And also see single Whitestart 30 ft up in tree, 20 ft away from Jubberlies. Whitestart singing NOBWA. Then hear more Rattle-flourishes low in scrub, also about 20 ft from Jubberlies. This is definitely a mixed flock. And certainly partly or wholly the same as the flock seen here yesterday.

Jubberlies fly away. Nothing follows.

Whitestart moves gradually uphill. And the birds uttering Rattle-flourishes definitely fly \longrightarrow Whitestart (while remaining low in scrub).

Whitestart songs and Rattle-flourishes sometimes overlapping, sometimes alternating.

Then I see a single B. nigrocristatus fly \longrightarrow group 3 ft up in scrub. So I don't know if the birds heard uttering Rattle-flourishes earlier are Whitestarts or (other) nigrocristatus.

Whitestart stops singing. Immediately, I hear Deglossini Switters in distance (perhaps 100 ft away). NOBWA. Then stops.

Jubberlies reform \longrightarrow group. Then fly away again. Nothing follows.

Then a pair of pallidivucha appears. Moving low thru scrub edge road. 2-6 ft up. Utter occasional "Greetings". The pallidivucha pass right by the flock (perhaps 15-30 ft away) without hesitating for a moment. I.E. they certainly did not join the flock, even temporarily.

Flock is quite stationary. Or, rather, making irregular

circular movements.

I am going to walk back down road 7:08 a.m.

See a single Fidellia fly alone.

Passing area where Cy-like Twitterers were heard earlier. I find that they are still continuing. Still NODWA. And ind. still invisible.

Then, passing area where Altopetes 3-note songs were heard earlier, I hear more songs of exactly the same type further down hill. Most of these are NODWA. But some are completely overlapped by Whitstart songs. But Whitstart and Altopetes are very far apart at the time.

Then hear more Whitstart songs down road. NODWA

Things are getting quieter now - 7:19 a.m.

See a single Scoty through alone.

Back to flock area 7:40. Sounds as if Whitstart and Pranksters - Hemipungus-types have moved slightly down hill. Still noisy, but out of sight. But I do see pair of Fidellias by road. At least 100 ft from the other birds, but probably still (loosely) associated with them.

Then see single Whitstart. Probably the ind. with flock. Only very brief glimpse. Ind. is flitting about, 2-6 ft up, well within scrub. Silent. Disappears.

Then I hear a few Diglossini Twitterers (Cy ???) coming from the immediate vicinity !!!

8:02. Going down road. Hear more Altopetes 3-note Whistle songs. NODWA.

See a single Whitstart 6 ft up in scrub. Silent. Disappears.

only alone.

Laf

Then hear Laf singing up hill. NODWA

Will 'Will' 'Will' 8:10 a.m. See pair PL Altapetes.

Moving in scrub along edge pasture ca 4-6 ft up. Conspicuous. Noisy. Uttering "PN"s and Greetings. Feeding on berries. Also picking insects off leaves. After they leave one bush, a single B. mag rostratus appears in it. Utters Rattle-flourishes. Does not follow PL's at first. A few seconds later, I see a single Firebelly 4 ft up. In scrub 1-2 feet from PL's. Disappears. PL's continue moving thru scrub. Gradually up hill. Then a single CC j

CC

→ PL's. Definite. Lands only a few inches from the PL's. 4 ft up. CC probes in dead flower heads. Silent. PL's continue moving. CC f → PL's. Then B. magrostratus f →

CC

group repeatedly. Then I see a pair of wrens in scrub. 4 ft up. Wrens almost certainly same species as on Pivara. Wrens f → group. Then a pair of Firebellies (ru) appears. Flitting about erratically. Noisy. Both join and leave other birds repeatedly. Sometimes in front, sometimes in back, sometimes at sides of other birds. Then I see single Whitestart 50 ft up hill. Possibly locally associated with group.

The whole assemblage gradually moves up hill. PL's definitely the nucleus (altho not always leading). Apart from this, group does not appear to be highly organized. Inds. sometimes close together, sometimes very far apart.

Gradually disappears from view ca 8:25-8:30.

COMMENT: It is obvious that real mixed flocks are regular in this region. But they do seem to be comparatively rare.

small, and simple.

Presumably the principal difference between this region and the Quito-Pichincha-Atacazo region is that there are nuclear species (e.g. *Protheromys*, *Whiteropes*, etc.) here but not further west. But why are the nuclear species apparently confined to this region??

NOTE: According to all my local informants, it is the rainy season here now. But certainly I have been lucky so far. There has been no rain so far during my periods of observation on this side of the mountain.

Going back up road, 8:45 a.m. Hear Whiterant singing NODWA. Shuts up. Then hear more Atapetes Whistle songs. NODWA. Shuts up. Then more Whiterant song. NODWA. Shuts up.

Then see a single Fairbilly. Silent and alone. Low in scrub edge road. 2-4 ft up. Flies away.

Sun is coming out 8:50 a.m.

See another single Sooty Thrush alone. And then another.

Going down same side path as yesterday 9:06 a.m.

Hear more Whiterant song. NODWA.

10,250 ft Hear still more Whiterant song NODWA. Shuts up. Then hear Rattle-flourishes. This probably is first flock again. Now Whiterant songs and Rattle-flourishes are alternating without overlaps. Then shut up.

Laf Then I hear brief but unmistakable Laf song in distance. NODWA (or Rattle-flourishes).

Some distance further on, come across pair of ^WRuddy Gnatcatchers. Flitting 6-10 ft up. Many. Lots of R's. Alone except

Eusiphia

for a single ♀ or juv. *Eusiphia* sitting quietly 15 ft away. Is this as
 sociation coincidental? In any case, *Eusiphia* disappears from view.

Then single White-tail shows up, 20 ft away, 20 ft up in
 trees. I can also hear *Freibellus* in distance "behind" White-tail.
 Is the old flock showing up again? Yes! I can also hear *Basileuterus*
terrestris and/or *Hemiprocne* coming up behind White-tail.

But, unfortunately, they go around me, in scrub, without
 my being able to see them.

I have to start up hill again 9:37 am

A few ft on, come across what may be partly same flock. 6 or
 7 flycatchers and other small birds in tree tops. Unidentifiable. Also
 1 very large dark bird with banded wings!

Also hear White-tail singing close by. Must be member of
 flock. Also hear *Freibellus*. Also must be in flock. (Actually, there
 must be two *Freibellus* here.)

Flock going up hill with me. See one of the *Freibellus*.
 8 ft up in small tree.

This flock is quite diffuse now.

Leaving 10:00 am.

NOTE: It is very remarkable that I have not seen a
 single juv. warbler or dendrocolaptes here. This is another indica-
 tion that mixed flocks cannot be very common here.

March 8, 1966
 Road to Papallacta

I am going to work above Pifo today, on western slope

Fal
 of the mountains, where Laf and Ann were seen the day before yesterday. Arrive 5:59 a.m. Still quite dark. Clear.

SEE TODAY'S NOTES ON MIXED DIGLOSSINI

6:45. See a single Sooty Thrush alone.

NOTE: I have heard finch-like sounds around here.

Without seeing the birds. Also some sounds which might be the bonariensis. Again without seeing the bird(s).

7:33. See a single Atlapetes. Definitely rufinucha. Moving thru scrub, 2 ft up. Silent. Definitely alone.

Also see some more Sooty Thrushes alone.

8:15. See a single Yellow Grosbeak fly by. Silent & alone.

Also see more Sooty Thrushes alone.

COMMENTS: There is no doubt but that the fauna here, on the western side of the Eastern Sierra, is more like that of the Quito-Pichincha-Atacazo region than like that of the eastern slope of the Eastern Sierra. This probably is what should have been expected.

What does surprise me, however, is the extreme rarity of tanagers here and, to a lesser extent, in the Quito-Pichincha-Atacazo region. Certainly a lot more tanagers would be found in similar-looking environments in Colombia, Venezuela, and Bolivia.

Is the rarity of tanagers here "simply" due to the fact that there is no good "upper sub-tropical forest" nearby? I.E. do the tanager species need "USTF" as "refuge" when conditions become unfavorable — in spite of the fact that they can occupy other environments when conditions

are more favorable ?????

(42)
March 9, 1966
Road to Papallacta

Going to work in same place as yesterday morning. Arrive 6:09 a.m. Just starting to get light. Morning is clear.
See a number of sooty Thrushes alone. Both singles and pairs.

7:36. See a group of at least 3 maroon-crowned cotingas in small trees in distance. Apparently alone.

Then hear some Forficulivora in distance.

7:54. See single Forficulivora perch 20 ft up top tree. Silent and definitely alone.

7:59. Hear some bonariensis vocalizations.

A few minutes later, hear unmistakable Dubonia in distance.

So there are some tanagers here!

8:47 A group of 5 bonariensis fly by, overhead. Silent. Definitely alone.

8:57 A couple more bonariensis fly by. Also silent and definitely alone.

Then see pair of rufinucha. Moving thru region of thick but very low scrub: 6" - 3' up. Utter occasional soft "cn"s but otherwise quiet. With CR. Quite conspicuous. But definitely alone.

SEE ALSO TODAY'S NOTES ON MIXED DIGLOSSINI

March 10, 1966
Atacaso

Go down Old Road to Santa Domingo. Park at 10,700 ft at 5:55 a.m. Still quite dark. There is a light but steady rain. Everything quiet.

A very few faint miscellaneous birds sounds ca 6:08. Then a few more 6:15 a.m. Hummers etc.

Rain is almost stopped now.

This is a region of rather scattered miscellaneous scrub and pasture.

Albino?

Hear a few R's which might conceivably be Albinos!

Hear first Atlapetes Whistle songs 6:18. NODWAH

Then some Furbelly sounds. Completely overlapped by the Atlapetes. Again and again.

Atlapetes shut up. Furbellies continue. Then something begins Rattle-flourishes ("Rfl"s). Rfl's and Furbelly sounds apparently overlapping at random.

It is still quite dark 6:22. Cloud cover is very thick and very low.

Walking along road, hear another Atlapetes uttering Whistle songs. NODWAH. But overlapping Furbellies and Rfl's in distance apparently completely at random.

Light rain starting again 6:25 a.m.

Walking back along road hear lots of Rfl's, Furbelly sounds, and Atlapetes Whistle songs. All apparently overlapping completely at random.

I think that all 3 species probably are in breeding condition

See some single Sooty Thrushes alone.

There is a lot of bamboo around here. Area obviously is very humid. Looks more humid than areas above Papallacta.

Atlapetes songs continuing full blast 6:36. NODWAH. All other species becoming more quiet too.

Atlapetes shut up. Hear single Diglossini Twitter in distance. NODWAH. Then there is more Atlapetes song. NODWAH.

Laf 6:40. Laf sings one brief phrase. Completely overlapping several Atlapetes songs.

6:43. See single Atlapetes moving thru scrub, 2 ft up. Definitely rufinucha. Uttering AL's Definitely alone.

Then see another Atlapetes singing downhill. Exposed 3 ft up. Definitely also rufinucha and also alone.

Laf Another Laf sings far downhill. Again completely overlapping Atlapetes Whistle songs.

NOTE: All the scrub here is more or less low. Probably largely second growth. Certainly not "Upper sub-tropical forest".

Laf Walking further along road, hear another Laf singing up hill. NODWAH. Then a second Laf also sings. Two inds. apparently overlapping at random. 6:50. Also completely overlapping RFL's.

Rain almost stopped again.

Further down road, hear more Atlapetes songs. NODWAH.

Then see single Firebelly Perched 10 ft up. Silent. And definitely alone.

Also see more Sooty Thrushes alone.

Laf Atlapetes shut up. Laf sings downhill. NODWAH. Shut up. Atlapetes resume. NODWAH. Overlapping when songs apparently at random.

6:58. See another rufinucha. Definitely alone. Uttering "alcn"
3" up in herbage by side of road. Flies off and joins mate in scrub-
across road. Both hop thru scrub 6" - 3' above ground. Uttering
lots of "ON"s and twittering greetings. Both still definitely alone.
Then hear Laf song. NODWAH. Partially overlapping wren
songs.

Then Laf shuts up. Hear Duglonnie Twitter down hill. Probably
Cy or CC. NODWAH. Shuts up. Laf resumes NODWAH.

NOTE: I find that there are some medium sized trees here. In
the ravines. Probably second growth.

7:12. More Laf song. NODWAH.
Walking back up road, see 3 Atlapetes rufinucha feeding tog-
ether on ground. Two of these probably are "pairs" I saw earlier. Quiet
now. Definitely alone.

A little further on, hear another Atlapetes uttering Whistle song.
NODWAH. Shuts up.

Further on, hear Dubonia singing in distance.

Then see another pair of rufinuchas feeding in very low scrub
along side of road. Definitely alone.

7:21. More Laf song in distance. NODWAH.

Further on, see a single rufinucha. Silent and definitely
alone. Feeding in scrub 1' - 4' up.

Then see a single Eusifera perched 10 ft up in small Eucal-
ypt. Silent. Alone. Flies off immediately.

7:33 See a single CC (More or less all buffy underneath).

Feeding on small cup shaped yellow flowers in bushes. 1' - 3' up. Utters
occasional "CN". Definitely alone.

Rain starting again.

More Laf song. NODWAN.

17:40. Further up road, hear Scan songs and flight displays. This certainly is at least near where Laf sang earlier this morning. But Scan sounds are NODWAN now.

Then see singing Scan. Perched 15 ft up in small Eucalypt. Alone. Identification is definite.

Then see pair of Fimbrellies. 2-4 ft up in mixed scrub and bamboo. Uttering cd's. Definitely alone.

Leaving this area 17:50 or so.

Just as I start to go, I see a peculiar "group" some distance uphill. One or more Rufinuchias (s) moving thru scrub edge pasture. 1'-4' up. There also is a pair of Fimbrellies (same pair seen a few minutes later) moving more or less parallel with the rufinuchias. But about 20-30 ft uphill. And there is a single cc feeding in bushes about 20-30 ft behind rufinuchias. All birds quiet.

There also are 2 or 3 small grayish birds in same general area. Probably finches or flycatchers.

"Group" disappears from view almost immediately.

This might, conceivably, have been a "real", "organized" flock. But, if so, it was remarkably diffuse.

Leaving (again) 17:58 am.

Go on down to area 10, 325 ft. Region of very mixed second growth scrub. Lots of bamboo. Quite lush. Arrive 8:07.

Everything very quiet.

Walking up road, hear more Laf song. NODWAN.

Then single Laf flies by. Alone.

Well! Well! Well! 8:04 am. See real definite mixed flock.

L. In thick scrub uphill. Includes 3 Sottis, 2 Whitestrupes, 2 Mang.

anorris, and 1 or 2 White-bearded Flycatchers.

Margarornis is the "usual" species. Same species seen near Anduavi and elsewhere in Andes.

Whitestripe is quite small. Presumably Banlecterus. For a part of crown and cheek patch really quite dark.

All birds moving thru scrub - 2-6 ft up. Progressing very rapidly. Quite coherent. Most inds. usually 1'-12' apart. Uttering lots of "N"s but little else.

Leadership definitely changing. Once Margarornis definitely in lead. Once White-beard(s) definitely in lead. Littis possibly in lead at other times.

Both Littis and Whitestripes definitely picking insects off leaves.

Once, two Littis try to land on same perch. A dispute breaks out. Accompanied by long, loud R.

When flock was first seen, there was one rufinucha "in" it. Silent. 2 ft up. In rear of group. But this rufinucha definitely did not follow the flock in its progression. I.E. the association of the rufinucha with the other birds apparently was "purely" casual!!!

Interestingly enough, there also was a pair of Firebellies about 50-75 ft from the flock at one time. And these Firebellies made no attempt to join or follow the group.

Flock has disappeared by 8:20 am.

Laps still singing occasionally 8:37. NODWAH

Walking down road 9:15 am. 10,050 ft. See single rufinucha. Silent. 25 ft up in tree. There also is a flycatcher lower down in same tree. From the sound, a Whitebeard. Then flycatcher flies away. rufinucha does not follow.

A few minutes later, see another rufinucha 10 ft up in a different tree. Possibly same individual. Definitely alone now.

Everything very quiet 9:23.

Then there is another outburst of Laf song. NODWAH. But this Laf song does overlap Rfl not very far away. Then Laf shuts up.

See some more Sooty Woodpeckers alone.

Then see single Ocellularia flycatcher carrying n.m.!

Alas! 9:28 suddenly catch glimpses of 2 or 3 Butorampis. Unfortunately I could only see them from underneath. But I am almost 100% certain that they were the Big species. Very active and very noisy. Incredibly conspicuous. Uttering lots of loud, plaintive, slightly hoarse, whistles. Usually doublets and triplets.

"Blee-blee" and "Zlee-zlee zlee" One bird leads beside another. Postures. Elaborate Bill-ups. Then, apparently the feeds the other. These birds definitely are quite alone. Fly off after a few minutes and disappear.

9:44. Going back up road. See a single rufinucha 10 ft up in scrub. Definitely alone.

9:52 10, 225 ft. Come across mixed flock which obviously is partly the same as the one seen earlier. Includes 2 or 3 Sittis, 2 Margarornis, 2 Whitestrupes, also two Forcellus. And at least one CC. All birds moving thru scrub 4-6 ft up. All uttering CN's. Whitestrupes also uttering R's. Forcellus also utter "Ta-ah" song.

Sittis apparently in lead. Whitestrupes definitely bringing up the rear. CC f —————> Sittis. Forcellus f —————> group repeatedly. Margarornis f —————> group repeatedly. Whitestrupes f —————> group repeatedly.

Leaf Leaf jumps furiously nearby. But apparently does not join or follow group.

Sittis Group moves down hill. But then the Whitestripes come up hill again! Apparently they have become separated from Sittis-Margarornis group! But then I see that the Whitestripes are accompanied by a single individual bird which is one of those black, white, and pale yellow macaw-like birds which I have never been able to identify! And then suddenly the rest of the group reappears. Sittis, CC, *Fimbellis*, *Margarornis*. And one White-beard. Now whole group continues up hill.

Sittis Now Whitestripes are definitely in lead. Sittis follow Whitestripes repeatedly. All other species follow group repeatedly. Whitebeard lags up the rear.

Sittis As far as I can tell, the CC is not associating particularly closely with the Sittis. But it certainly is picking insects off leaves in exactly the same way in exactly the same places.

Group is very coherent as it goes up hill. Soon disappears from sight.

Leaving 10:15 a.m.

COMMENTS: It is obvious that mixed flocks occur on both the eastern and western "frontiers" of the humid temperate zone in Central Ecuador.

But their distribution is very narrow. Why?

I might add that the vegetation at the area worked today (which I shall call "below San Juan"), and at the areas near Papallacta, does not look more suitable, now, for mixed flocks than other areas such as Nono and the higher parts of Atacaso.

Before seeing the flock today, I was beginning to think that mixed flocks occur only in "Upper Sub-tropical Forest" and semi-adjacent to such forest. This may be largely correct. But the statement probably should be re-formulated. Mixed flocks certainly occur in areas where "Upper Sub-tropical Forest" occurred recently, but from which it has disappeared completely in the last few years or decades.

(Probably, I have never worked in mature USTF except in the Western and Central Cordilleras of Colombia.)

The occurrence of mixed flocks on "frontiers" in this region does not necessarily invalidate my major thesis. The flocks seen so far have been rarer, simpler, and smaller than the flocks seen in Bolivia or the Western and Central Cordilleras of Colombia — or even the Eastern Cordillera of Colombia. (And note that the vegetation around Bogotá and Quasica certainly is not virgin, and not even "real" forest!!!!)

SEE ALSO TODAY'S NOTES ON MIXED DIGLOSSINI

March 11, 1966
Atacaso

Going to work below San Juan again. Where mixed flock was seen yesterday. Arrive 5:53 a.m. Just starting to get light. Sky partly cloudy. Everything silent.

First bird sounds heard 6:02 a.m. Through "CN"s and "all CN"s. Then there is silence again (in spite of the fact that it is already quite light).

Then some miscellaneous songs (species unknown) 6:07

Quite a lot of song by 6:12 a.m.

See first *Turdus* a 13. Perched exposed 15 ft up in tree. Singing. Definitely alone.

6:28. Walking down road. See a pair of *Turdus*. Moving through scrub, 6-10 ft up. Quiet. Definitely alone.

6:34. See single CC. Silent and definitely alone. Picking up leaves in scrub 8-10 ft up.

6:42. See single hummingbird *XVII*. Sitting quietly 8 ft up in scrub. Definitely alone.

Well! Well! Well! 6:50 a.m. Come across a pair of streaked flycatchers. Apparently *Thryothorus* (i.e. *XXXXX*) !!! Sitting about in trees and scrub, 6-12 ft up. Very active, but not making any progress in any particular direction. Also very, very noisy. Lots of R's and many other sounds.

Then a single Cy (definite - adult) flies by silently. Makes no attempt to join the flycatchers. Lands 40 ft away. Feeds on tubular red flowers. Disappears.

A few minutes later, pair of CC's ^{W W} j' \longrightarrow *XXXXX*. CC's silent. And apparently fly off again immediately. The flycatchers do not follow the CC's.

Obviously, territories of Cy and CC's are at least partly overlapping here. And both probably overlap *T*'s territories.

It looks very much as if these *XXXXX*'s are being conspicuous "in order" to attract other birds to form a mixed flock!!!! But so far they seem to have been unsuccessful.

Eventually, the flycatchers disappear. Probably go downhill.

7:07. Further down road. See pair of Whitestarts (usual species) about 100 yds downhill. Sitting about in tops of tall trees. *XX*

finally alone. One of the birds sings repeatedly. NODWAH. Shuts up.
See a single *Sooty Thrush* alone.

Lof

See a pair of *Sooty Thrush* alone. Then they fly off. One apparently chasing the other. With one brief burst of song. NODWAH.

Sun light approaching this area 7:18 am

Lof

See single *Sooty Thrush* perched 3ft up singing. NODWAH. Definitely alone. Shuts up. Immediately, Whitestart down hill begins to sing. Also NODWAH.

CC

7:20 Ca. 10,000 - 10,100 ft. Near Duluna singing down hill. Then see single *C* in scrub along road 2-3ft up. Feeds on tubular yellow flowers. Apparently cutting into bases of corollas! Utters a few rapid *Twitter*s. NODWAH. Apparently alone.

Starting back up road. 7:26. See another pair of *Finchella* 10-20 ft up in scrub. Quiet. Definitely alone.

Lof

Then *Sooty Thrush* song NODWAH. Shuts up.

Everything very quiet 7:40 am.

COMMENT: It's my impression that *rufinucha*s are less abundant here than further up the mountain, where mixed flocks do not occur. Is there a causal relationship here ??? If so, what? (Note that *rufinucha*s are quite abundant in Papallacta area, the other area where mixed flocks occur. But there they are replaced by other species. Which does not seem to be the case here.)

7:40. See single *B. nigrocrinitatus* hopping thru scrub. 3-4 ft up. Definitely alone. Utters some *Rfl*'s. (I am quite sure that all or most of the *Rfl*'s heard here have been by *nigrocrinitatus*.) It seems to be a common species, in spite of the fact that it is so difficult to see.

Then this bird meets another of the same species. Both fly off.

in long noisy hostile chase

See another pair of *Turdellus*. Quiet and alone 10-12 ft up in some all trees.

It is clouding up again 4:50 a.m.

Suf Further up road, hear more *Laf* songs and *Rfl*'s. Overlapping apparently at random.

CC 8:04. One of the sites where mixed flock was seen yesterday. See 2 *CC*'s and 1 *Turdellus* very close together. Low in scrub. Silent. *CC*'s fly off. *Turdellus* apparently goes in different direction.

CC A few yards further on, see what are obviously same *CC*'s again. Now definitely alone. Silent. 3-4 ft up in scrub.

Then see single *Dulania* across road. Definitely alone. Forest song. Then pulls *Enterpallars* off leaves 2-5 ft up in scrub. Flies off almost immediately.

Then see pair *Blue & Orange Tanager*!!! Feeding low in scrub 1-3 ft up. Apparently pulling up fruits and buds. Quite silent.

At same time, I can hear a variety of bird sounds, on other side of road, about 100 ft away. This is direction in which *Dulania* went a few minutes earlier.

Since, one of the *Blue & Oranges* is attacked by a hummingbird. Probable *XVII*. Tanager doesn't react. Hummingbird leaves.

Then the *Blue & Oranges* fly across road, into patch of scrub and forest where the other bird sounds have been coming from.

I eventually maneuver around so that I can see some of these other birds. A real mixed flock. Obviously partly the same as flock seen yesterday.

Butth Includes 3 *fittis*, at least 1 (presumably, in fact, 2) *Margarornis*, 2 *Whitestrops*, 1 *Whitehead*, 2 *refinichas* (?), and the *Dulania*.

sea. Possibly others.

All these birds quite coherent. Whitebeard in trees 10-12 ft up. Whitestripes in scrub 2-10 ft up. Sittis in scrub 6-10 ft up. Mangarornis in trees 10-15 ft up. Dulurus in scrub, ca. 4-6 ft up. surfundi as in scrub 6"-5 ft up. All birds quite noisy.

Sittis

Sittis apparently in lead. Dulurus f ———→ Sittis. All other species f ———→ group separately.

Sittis

It is obvious that "the" mixed flock here has a definite nucleus. Including Sittis, Whitestripes, Mangarornis, and Whitebeard. Other species attach themselves to this nucleus, occasionally and/or when they happen to be in the neighborhood.

NOTES: I never saw the Blue & Oranges again after I caught sight of the main body of the flock. Perhaps the Blue & Orange did not stay long (but they certainly did join it for at least a few seconds).

CC

Perhaps the CC's and Trubelly seen a few minutes earlier were "outers" of this flock.

Flock eventually moves on. Disappears. Except for the nucleus which stay behind. Perhaps they are separating themselves from the other birds.

Laf

Walk on further up road. Hear more Laf songs. NODWAH

8:48 a.m. Phrases fairly brief but repeated

See a couple of birds flit by very low in scrub. They might, conceivably be the "all rufous Synallaxis". Apparently alone.

8:55. See a group of 3 of the presumed Wromyias (LXXXXX1) flitting about in trees 8-15 ft up. Moderately noisy. Uttering occasional "N"s and R's. Apparently alone.

NOTE: As far as I can tell, these birds are essentially identical.

cal with the *Uromyias* of *Purpure* in almost all respects. But I have not (yet) been able to detect any differences in the "ground color" of different parts of the underparts. (Looks all pale whitish yellow.)

Litti
CC Then, a few feet further on, come across "usual" flock again. Now includes at least the *Littis*, *Whitestrupes*, and *Whitebeard*. In scrub c - 20 ft up. Also 1 *CC*! *CC* f ———→ *Littis*. Then *Litti* is and *CC* feed in same tree, picking insects off leaves. *CC* only 6 ft (or less) from nearest *Litti*. No obvious sign of hostility between species.

Possibly the "All-rufous *Synallaxis*" and/or the presumed *Uromyias* (also) were "outliers" of the flock.

It seems to be characteristic of this flock that the "nucleus" is always or almost always coherent, but the rest may be very diffuse!

Laf At one time, a single *Laf* comes within 35 ft of the nearest member of the flock. Silent. Feeds on red flowers. Goes away again immediately. (I don't think that this should be called "joining".)

The *Dulencia* is singing during part of the time I have the flock under observation. It obviously is not with the flock, or not close to the other birds, at the time.

Flock eventually goes down hill.

Go on up road a little further. Hear more *Laf* song. NODW AH. But completely overlapping long, loud, melodious song by many wren. This is another indication that song by members of the "Diglossine Social Complex" is not inhibited by any loud nearby noises!

9:25 10,425 ft. Come across 1 or (more probably) 2 *Atlapetes torquatus*. Very low in thick scrub. Uttering lots of short, soft, hoarse PN's. Then see single Blue + Orange 4 ft up in scrub about

40 ft away. Blue & Orange gradually comes closer to Atlapetes. Until it is only 15-20 ft away. I think this must be classified as a case of Blue & Orange j. → torquatus. Then torquatus hops further up in scrub. Begins to utter louder, longer, clearer, more usual "Long" Whistles. Then all birds go further back in scrub and disappear.

9:37 am. Hear CC-like Twitter in distance. NODWAH

A few minutes later, 2 torquatus back still noisy. But the Blue & Orange seems to have left them.

Starting back down road. Now 1st long NODWAH. Sluts up. Then hear 1 CC-like Twitter. NODWAH

Back to flock area 9:55. Flock apparently gone.

Then go down road a few yards 10:00 am. See what probably is part of flock. See 1 White-headed, 1 Whitestripe, 1 Blue & Orange, 1 rufigula, and 1 Whitestart (!). All scattered over very wide area. (At least 100 square yds). All quiet. All species moving at usual levels. Blue & Orange feeds on mistletoe.

This group is much more diffuse than earlier. Is this because Litt's (and Margarornis) have gone elsewhere?

Leaving myself 10:15 am.

SEE ALSO TODAY'S NOTES ON MIXED DIGLOSSINI

March 12, 1966
Atacaso

Going to work in the same area, below San Juan, again today. Arrive 5:58 am. Just starting to get light. Rather thick cloud cover. Everything quiet.

Hear first miscellaneous bird sounds 6:02. Thrushes. See a single Sooty Thrush alone.

Walking up road. SEE TODAY'S NOTES ON MIXED DIGLOSSINI.

6:27. See single B. microcrastus in scrub. 2-4 ft up. Very noisy and conspicuous. But definitely alone.

7:06. Going back toward area of "usual" flock. See a group of 4 or 5 birds moving rapidly thru scrub. Apparently all Throu is. Show no tendency to join microcrastus which I can hear about 20 ft away.

See single Swallow. 4 ft up in scrub. Quiet. Apparently quite alone.

About 30 ft further on, see pair of Synallaxis. Silent. 3 ft up in mixed-bamboo scrub. These definitely are unirufa. And the birds are quite close to where I thought I saw same species yesterday. Apparently quite alone now.

Doesn't unirufa occur in mixed flocks in this region?? (If it really is absent from mixed flocks, it would be very nice for my general hypothesis!!!).

7:25. Area of "usual" mixed flock. See pair of Blue & Oranges moving thru scrub and small trees. 1-20 ft up. Very conspicuous. Very noisy. Uttering constant "Zuee zuee zuee zuee..." notes. Presumably PN's. But definitely alone now.

But then I run into flock only a few minutes later. Unfortunately, I don't get a very good view of it. Coming rapidly uphill. Certainly includes at least 3 Sittis, 2 Whitetrupes, 1 Rufinucha, and 1 GT! GT disappears almost immediately, and I don't know where it goes.

Sittis and Whitetrupes alternating in lead. Sittis f —
→ Whitetrupes at least 10 times. Whitetrupes f —→ Sittis

at least 10 times. Both species range 10-20 ft up in small trees. Picking insects off leaves. Both noisy. Whitutupes utter many R's.

rufinucha low in scrub. 2-3 ft up. rufinucha f → group at least once. But then seems to fall behind.

fettis - Whitutupe - rufinucha group eventually comes up to where unruya seen earlier. And unruya still there (and now I see that there probably are 3 inds. of the species here). unruya become very vocal as group approaches (altho this may be a reaction to me rather than to the other birds). And then the unruya apparently "drift after" the group for 20 or 30 ft or so. Remaining very low in scrub. But the fettis and Whitutupes are moving so rapidly that the unruya apparently cannot "keep up" so they apparently stop following.

NOTE: I would have said that the Blue & Oranges seen earlier were on their way down to join this group, but I did not see them with the group when the latter was visible.

f+j One or more of the local Laps sang vigorously when the flock was around. But none of the Laps joined or even (as far as I could see) approached flock.

f+j After flock goes, however, I see a couple of Laps alone. Apparently disputing. Lots of song. NODWAH. It is conceivable that this dispute arose because one of the Laps "strayed" as a reaction to the flock.

7:55. Same area. See pair of rufinucha 2-3 ft up in scrub. Uttering lots of "ALCA" s. Apparently alone (now).

8:01. Lower part of "usual" flock area. Hear and then see Dubonia singing. 10-15 ft up in trees.

W About 30 or 40 ft away, in one direction, is a pair of Cys.

Moving about in scrub 3-10 ft up. Uttering lots of loud "Tut" Notes.
Also 1 song phrase. NODWAAH.

Laf XVII
This is exactly where Laf - Hummingbird XVII reactions were seen 2 days ago. I.E. Cy territory must overlap that of Laf completely. And must overlap that of XVII at least partially. Neither Laf nor XVII is visible or audible at the present time.

About 30 or 40 ft from the Dubusia in another direction is a pair of Firebellies 15 ft up in trees.

Cy I think that these Firebellies, Cys, and the Dubusia must all be clumped as alone.

Firebellies fly off down hill. Firebellies j → White bearded! Then Firebellies feed on mistletoe. The exact same clump on which Blue & Orange fed yesterday!

Cy Laf Cys and Dubusia disappear. Apparently in different directions. Some minutes later, markedly Laf begins to sing. NODWAAH.

Then a single rufinucha appears in scrub. Uttering lots of "alcn"s. Definitely alone.

Sun is out now - 8:15 a.m.

About 100 yds down road, see single Firebelly in tree 12 ft up. There also is a small flycatcher in same tree (Contopus??) Firebelly flies off. Flycatcher does not follow.

Then see (another?) pair of rufinuchas very low in scrub. Very noisy. Lots of "greetings". Apparently alone.

Cloud is coming up again now 8:30. Everything is rather quiet. At least for time being.

Laf Some Laf song in distance.

See some more single sooty Thrushes alone.

Some distance further down road, hear more Dubusia.

long. This cannot be uttered by same ind. heard previously.
 Then see pair of *Trichellus* 20 ft up in tree tops. Alone.
 Also an apparently single *Trichellus* alone, 1 ft up in bamboo scrub several hundred yards away.

Laf

Then see a single *Laf* silent and alone, 2 ft up in scrub.
 Then a single *rufinucha* silent and alone, 1-3 ft up.

Some patches of thin fog coming in 8:55 a.m.

Reach 10,030 ft level and then start back up road.

See another pair of *Trichellus* alone 9:00 a.m. 2 ft up in scrub along road. Rather quiet.

Then see single *rufinucha* alone. Undoubtedly same individual seen a quarter of an hour ago.

Hear what sounds like Big Buttercup up hill 9:03.

See pair *Trichellus* alone (again).

Laf

Laf singing occasionally. NODWAH.

See another single *Trichellus* alone 4-6 ft up in scrub. Quiet.

9:22. Not far below "usual" flock area. See pair *rufinucha* 2-6 ft up in scrub. Noisy. Definitely alone.

Laf

See a single *Laf* alone.

Back to "usual" flock area 9:30. Flock apparently not around. So I guess that it does make some appreciable movements sometimes!!! Not a purely resident "clump"!

Leaving this area 9:45 a.m.

Go down road to 9875 ft level. Miscellaneous scrub. Not very different in appearance from scrub higher up.

Laf

Hear *Laf* long. NODWAH.

See a pair of *Trichellus*. Moving thru scrub and trees, 10-15 ft up. Noisy. But definitely alone.

Walking further down road, see another single Firebelly alone 10 ft up in very poor looking scrub.

Then see group of at least 5 Wormys chasing one another thru top low scrub 4-6 ft up. Very noisy. Apparently disputing. Certainly alone.

Further on down road, 9825 ft, see another single Firebelly alone.

10 Then see pair CC's 2 ft up in scrub side road. Definitely alone. One ind. utters Twitter greeting when it lands near NODWAH. Then both fly off.

Well! Well! Well! 10:05 a.m. See single Margarornis. As far as I can tell, definitely the usual species. Tree occupying in small trees 15-20 feet up. Definitely alone!!! Then single rufinucha appears. rufinucha & Margarornis. rufinucha perches about 5 ft from Margarornis. Quite silent. Then rufinucha suddenly swoops at Margarornis! Definite supplanting attack!!! Margarornis flies to an adjoining branch. rufinucha flies away. Margarornis stays for some minutes. Definitely alone all the time. Then it is frightened away by a passing truck.

This incident would suggest that some of the Atlapetes I have seen with flocks have been merely "escorting" - just like Diglossa!!!

Not after

Then hear more Laf Song NODWAH.

What has happened to the Aters? ??????

See single Whitetail. Silent. Definitely alone. 1-10 ft up in rather thick scrub.

10:25 a.m. Come to ravine with rather thick vegetation.

More trees. 9,750 ft. Hear more Dubusia Song

Come across another group of 3 or 4 presumed Wormys. Very

y now, 2-6 ft up. Apparently alone!

Then see another single *Forficula* fly by. Definitely alone.

Starting back up road 10:35 am.

10:41 A single *Butorides* flies by overhead. Can't tell species. But sounds like Big. *Vittoria*. Whittles. Definitely alone.

Alia! 10:50 am. 9225 ft. See single Black *Diglossa*. Silent. Alone. Feeding red flowers 2 ft up in scrub. Shows absolutely no trace of dispatcher patch. I.E. presumably. Alia! Then moves off thru scrub. Pauses about 10 ft from pair of *Guillemots*. No reaction between the 2 species. *Diglossa* disappears! *Guillemots* remain. Alone.

Further along road, see yet another single *Forficula* alone. (This probably is the same as one of the individuals seen some time ago.)

10:58. See Laf. Swallow. Silent. Alone. Feeding on tubular yell ow flowers. Same species on which C was seen to feed yesterday. Laf definitely picking corollas.

Leaving 11:02 am

COMMENT: It is quite remarkable that I have seen only one really large, highly organized, long sustained mixed flock R here in this region below San Juan. Mixed flocks certainly are not well developed here!

It probably is not coincidental that this one large flock spends a large part (not all) of its time in the ravine with the largest amount of "forest" (i.e. real trees). But the difference between the vegetation of this ravine and that of many other ravines (and other areas) is not very great.

In fact, I am beginning to think that the large mixed flock occurs in this one ravine simply because the flocks "happen" to have settled there!

March 13, 1966
Atacama

Going to work at last place visited yesterday, i.e. below San Juan, starting at ca. 9845 ft. Arrive 6:00 a.m. Getting light. Clear. Cool.

Dawn chorus already started. At least thrushes 6:18. See single rufinucha. Hopping thru small trees and scrub 3-10 ft up. Definitely alone.

Some distance further on, see another rufinucha perched exposed 3 ft up. Uttering "cn"s. Also apparently alone.

See some single sooty thrushes alone.

Then see apparently single B. nigrocrinitatus 6-8 ft up clump very dense scrub (with some bamboo). Singing. Apparently alone. B. nigrocrinitatus Rfl's overlap rufinucha songs at random.

6:35. Hear Dulania singing down hill. Also overlapping nearly rufinucha songs at random.

Further down road, hear more rufinucha and torquatus. Also completely overlapping.

6:44 a.m. 9845 ft. Area mixed bamboo scrub edge ravine.

W Hear lots of Diglossine Twitter and other sounds. Then see single Cy flitting thru bushes small trees, 4-8 ft up. A few feet away, there is a pair of H. atropileus !!! 3-4 ft up in bamboo. Very noisy. Whistles & R-Twitters. This must be considered a mixed flock. But then Cy flies away. atropileus do not follow. They continue on thru bamboo scrub. Definitely alone below.

W Then Cy reappears. Feeds in scrub at least 150 ft from atropileus. It must be considered alone now. Pays no attention to the

atropileus.

6:59 am. Going back up road. See single Whitestripe Quail. 3 ft up in scrub. Definitely alone. Flies off across ravine. Nothing follows in flight.

NOTE: The actual white stripe of the Whitestripes here is very conspicuous. Quite broad. Going quite far behind eye.

7:06. See single Scrubwren. Definitely alone. 3 ft up in scrub. Then hear first Laf song. NODWAH. Then see 2 Lafs. One chasing the other thru scrub. Chase accompanied by lots more song. Birds are definitely alone.

7:13. See single All-rufous Synallaxis moving thru scrub. 3-6 ft up. Doing some "tree creeping". Silent. Apparently alone. Then a pair of Scrubwrens flies into same patch of scrub. Very active and noisy. Flitting about 6-12 ft up. All-rufous follows Scrubwren at least 4 or 5 times. Then Scrubwren fly far away. All-rufous does not follow. Apparently left alone now.

CORRECTION: Now I see that there really are 3 All-rufous here. Definitely alone now. Quiet.

NOTE: This is almost exactly the place where I saw the single Mangrove alone yesterday.

7:28. See a pair of Scrubwrens 10 ft up small tree. Definitely alone. Then see another single Scrubwren alone. And a single Laf alone.

7:33. Top of road. Region rather poor-looking mixed bamboo scrub. See a diffuse flock (or "semi-flock"). 2 or 3 Whorl flitting about noisy 3-5 ft up in bamboo. 1 CC picking insects off leaves in tree, 6-10 ft up, above them. 20 ft away from Whorl there is a pair of rufous moving thru bamboo. 2-6 ft up. Also 20 ft from the

Wronyas, but in opposite direction, is a pair of B. nigrocrinitatus 3-4 ft up in bamboo. Wronyas fly off. CC f —————> Wronyas rufinucha and nigrocrinitatus do not follow the others. Both species go their separate ways. Both must be considered alone now.

Starting back down road 7:47 a.m. (Sun is finally beginning to reach this area.)

Everything very quiet now.

See another single Ficibellus alone. 6 ft up in tree.

Then see pair of rufinuchas 3-6 ft up in scrub. Also alone.

Go on down to 9650 ft 8:27 a.m. see a single Duloria. Morning low then low, impoverished scrub 1-4 ft up. Then begins to sing. Definitely alone.

Starting back up road 8:32.

Near Raf singing at this 9650 ft level. NODWAH. Shuts up.

A few minutes later, same level, see single Whistler flitting from tree to tree. Silent. Definitely alone.

8:58 a.m. Very near spot where Ficibellus and All-rufous Synallaxis seen earlier this morning. See 2 Ficibellus flitting about in trees 4-12 ft up. Also 3 All-rufous Synallaxis 1-5 ft up in bamboo scrub. The Ficibellus and All-rufous do not seem to be paying much attention to one another. But they certainly come within 20 ft of one another occasionally. Then Ficibellus disappears (probably frightened of me).

At approximately same time, 2 or 3 Synallaxis CTV appear in scrub very close to the All-rufous. There is a great outburst of activity, all birds of both species flitting about close together, with lots of vocalizations. This looks like a hostile dispute. Then all birds move down hill. All-rufous f —————> CTV repeatedly. (But all or most of

this following probably is really hostile chasing)

9:08. A single Furbell flits thru same area. Silent and alone.

COMMENT: Probably these Furbellies and All-rufous are not forming "organized" flocks. Probably the 2 species associate with one another simply because they tend to stick to same area.

ADDITION: When Synallaxis dispute was at its noisiest, a single Atlapetes rufinucha approached and came within 10 ft of the disputants. Then went away again. This must be considered a case of joining. But the rufinucha probably was motivated only by "curiosity" or hostility.

9:18. Same area. See a pair of rufinuchas 2 ft up in scrub. Utter quitters. Definitely alone.

9:24. Just a few feet farther up road. See pair of Blue & Oranges moving thru low scrub 1-3 ft up. Uttering "CN"s. Definitely alone.

Some distance further on, see another single Furbell alone. And then another one 300 ft further on.

9:38 am Some distance further on, come across another pair of Furbellies. 10-20 ft up in trees. Definitely alone. One of the birds (presumably the ♀, as it is the duller of the two) is displaying. Moving about sitting, and standing, with wings held slightly away from body and drooped but not spread. Apart from this wing pattern, the rest of her postures and locomotion patterns seem to be quite unutilized. I see no obvious ruffling or flapping. Every once in a while, the ♀ utters a "strangled" version of ordinary "Ja-ah" song. When she does this she also Q's her wings. She also utters pure R's from time to time. This is not accompanied by Q. Finally ♂ comes down. ♀ immediately assumes a nearly horizontal posture. Also does TV. And Q's her wings.

again. Silently this time. But ♂ moves away again and ♀ relaxes again. Both continue to move around actively.

Loj At one time, during this performance, a single *Taf* fly →
Furbellies. Then *Taf* flies away. *Furbellies* do not follow. Fly off
 a few seconds later in a slightly different direction.

Same pair *Furbellies* back a few minutes later. Definitely alone
 now. Moderately noisy "PN"s and "EN"s.

Leaving this area 9:55 a.m.

* Reach area 9400 ft 10:02. Some quite good looking AS around
 here. Thick, if not very tall. Everything very quiet.

A little further down road, vegetation is taller. Looks almost
 transitional to "USTF".

Everything absolutely dead! Looks almost as if all the birds
 had gone off in a huge mixed flock! But this appearance probably is mis-
 leading. The general quiet probably is a reaction to the bright (and hot)
 sunshine.

Hear a few bird sounds 9300 ft Very low in scrub. Possibly *tor*
quatus "PN"s. Also hear *Duluria* singing down hill.

Just clouds coming up 10:26 a.m. Starting back up road.

See a single *Furbellies* fly by. Silent & alone.

Further up road 10:41. Hear *torquatus* Whistle "Long" NODWA
 H. Only lasts for a few seconds. It looks as if *torquatus* may largely
 or completely replace *rufinucha* in this more humid-looking region!

Cy Then see single *Cy*. Silent & alone. 20 ft up in tree.

9:50. See group 2 or 3 Whitestarts. 2-6 ft up in scrub. Uttering
 "CN"s. Definitely alone.

Hear Rfl's in distance.

Leaving 11:00 a.m.

SEE ALSO TODAY'S NOTES ON MIXED DIGLOSSINI

Litts
COMMENT: One aspect of the forest area worked today was very striking. This area seems to contain all the species, except Litts, that are common in the slightly higher area worked on previous days. But large, long-maintained flocks seem to be absent here - while at least one occurs in the higher area. This suggests that Litts play a notably important role in the flocks of this region.

March 14, 1966
Atacaso

Going to work below San Juan again. Last place worked yesterday, i.e. 9400 ft and below.

Actually we overshoot the mark, go down to almost 7200 ft. Arrive 6:05 a.m. Getting light. Generally cloudy.

Can hear some DC already! Then some Whitestart songs NODWAH. But completely overlapped by DC.

This area seems to have rather good forest-scrub. Perhaps intermediate between AS and VSTF.

6:12. Foxit rufinucha-type song. Completely overlapped by DC. Then Whitestart songs again. Partly overlapping rufinucha. Elia (again) completely overlapped by DC.

Then there are some more partial or complete overlaps of rufinucha-type and Whitestart songs. Then both shut up.

Then more Whitestart songs NODWAH. Shut up. Then more rufinucha-type songs. NODWAH. Both overlapping Foxbelly songs apparently at random.

DC might well be by atropileus

More Whitestart song. NODWAH. Then see single Whitestart. Definitely alone. 15 ft up.

Then see single Firebelly alone. Also pair rufinucha alone. Both ranging 10-12 ft up.

Then see pair of Whitestarts and single atropileus close together at 4-6 ft up in tree above bamboo scrub. Whitestarts fly off, atropileus follows. → Whitestarts. Then I lose sight of birds.

DC starts again 6:29. Now I am sure that it is by atropileus. It sounds as if the atropileus here are in breeding condition!!!

Whitestarts sing again. Completely overlapped by DC. Then both species shut up.

See single rufinucha fly across road. Definite and alone.

6:36. Some distance away, see another pair of Whitestarts. 4-6 ft up in bush edge rock slide. Definitely alone. Joined by third Whitestart. This provokes some singing. NODWAH.

Then see single rufinucha singing. Definitely alone. Perched exposed 20 ft up in tree. At first NODWAH. Then Whitestarts sing again. Complete overlap. Whitestarts shut up. rufinucha continues NODWAH. Whitestarts resume. Again complete overlap. Whitestarts shut up. rufinucha continues NODWAH.

Certainly, there is no mutual inhibition of song between Whitestart and rufinucha!!!

Walking up road 6:45. Hear Dubusia singing in distance. Things are getting quieter now.

See a single Firebelly alone 3 ft up in scrub.

Further along, see pair Firebellies. 8-15 ft up in tree. Apparently alone.

6:55. Above 9300 ft. Region where I worked yesterday.

See pair rufinucha 2-3 ft in poor scrub edge rock slide. Definitely alone

NOTE: rufinucha certainly is not replaced by torquatus here!

7:00 a.m. See pair Blue & Oranges. Moving thru low scrub edge road. 6" - 3' up. Uttering "CN"s. Eating berries. Definitely alone

NOTE: This may be another species which is less gregarious here than in some other parts of the Andes.

7:05. See group of 3 Big Buttercups (identification definite) and 2 Firebellies, all very close together. 20-25 ft up in trees. All feeding on berries. All very quiet. Big Buttercups supplants Firebelly. 2 Sooty Thrushes → group (!!!). Then the Big Buttercups gradually move on. Apparently neither Firebellies nor thrushes follow.

See single Whitestart definitely alone. 2 ft up in scrub.

NOTE: There is a road marker here which says "30 KM".

Then presumed by singing 7:20. NODWAH

Go on up road to 9440 ft. Then start down again

Near Whitestart singing. NODWAH

COMMENT. It seems to me that Mutual Inhibition of song

probably is most apt to occur between serious competitors. (Very different relations of rufinucha and torquatus vis a vis Diglossini.)

This would be advantageous. It would tend to prevent a species from settling down in areas where too many competitors are present. It would save time and waste of energy.

NOTE: There are a lot of hummingbirds here. This may help to explain why Diglossini (apparently) are rare here.

7:33. See a couple of sooty Thrushes alone

Then see a single rufinucha alone 20 ft up in tree

Then see pair Firebellies alone. 1-2 ft up low scrub along

road CORRECTION. This is definite mixed flock. Firebellies fly across road. Then I see that there is a pair of rufinuchas and a pair of Blue & Oranges in scrub the Firebellies just left. Then also fly across road a minute later rufinucha f ———→ Firebellies. Blue & Oranges f ———→ group. All birds keeping very low. All birds also very quiet. But group as a whole is very coherent. And is always steadily progress in one direction.

7:43. A little further down road see single Firebelly 20 ft up in tree. Silent. This bird definitely is alone.

Then see group Big Buttercupis in tree tops 40 ft away. They also seem to be quite alone now.

See another single sooty Thrush alone.

Everything dead quiet now 7:57 a.m.

Get back to car 8:00. DC seems to be continuing! But it stops almost immediately.

8:02. See single Big Buttercupis. 20-30 ft up in trees. Very noisy. Rattles and "N"s. Definitely alone.

Going on down road now. Region largely bamboo scrub.

See single maroon-vented cotinga perched 30 ft up in tall tree in midst of bamboo. Silent. There also are 3 Thomyzas chasing one another in same tree. Very noisy 10-30 ft from cotinga. But there is no overt reaction between the 2 species. I.E. not a real flock. Then Cotinga flies off. Flycatchers do not follow.

8:17. See group of 3 rufinuchas. Moving along scrub edge bamboo 4 ft up. Definitely alone.

* Sun coming out 8:25 a.m.

8:29. 9025 ft. Hear hoarse begging type notes coming from grass between scrub and road. Then see single rufinucha hopping about in nearby scrub. Carrying huge mass of caterpillars in beak! Obviously

going to feed young! Bird (or species) definitely alone

NOTE: Can see White Cereopias further down valley. I.E. this region really is very hummed.

Go on down to 9000 ft without seeing anything more. So start back up road again 8:45.

8:53. Hear what sounds like Cy singing down hill. NODWAH. Back near car, hear more *Dubusia* song.

* See a single *Whititart*. 3 ft up in scrub. Alone

9:10. See pair of *rufinucha*s. Quiet. 2-3 ft up in scrub along road. There also is one or more *Hemispungus* or *Basileuterus* type in same scrub approx. 20 ft away. I can't tell if the 2 species are associating or not. Then I see a couple of GT's. One is in tree, 20 ft up. About 30 ft from *rufinucha*. (and even further from *Hemispungus* or *Basileuterus*). The other is about 40 ft away. Both very noisy. Loud metallic nasal notes. Single notes and R-like patterns. Slightly reminiscent of Big Buttercup. Finally, the distant bird joins the nearer one. Both move off. Nothing follows. I think these GT's must be classified as alone.

9:33 am Some considerable distance further up road. See group 2 or more All-rufous *Synallaxis*. Very low in very thick mixed bamboo scrub. Very quiet. Apparently quite alone.

A little further on, single *G. flus* by alone. Goes from tree to tree, over a small, enormous area.

Leaving 9:50 am.

SEE ALSO TODAY'S NOTES ON MIXED DIGLOSSINI

COMMENT: *Atlapetes leucopterus* here seems to fill much the same ecological niche as *Saltator aurantirostris* in some other parts of the Andes.

March 15, 1966
Hono

Avenue town itself 5:54 a.m. Starting to get light. Clear.
Brown Chorus is in full swing! Good!!!

6:12. See a couple of single Sooty Thrushes alone

SEE TODAY'S NOTES ON MIXED DIGLOSSINI.

6:24. See single torquatus. Silent and alone. Hopping along ground in middle of dirt path!

NOTE: Looking around, I can see that all the vegetation around here, including the scrub, is very obviously second growth. But some of the scrub certainly is lush!

6:32. See pair of torquatus silent and alone. On ground of path. One of these presumably same individual seen earlier.

See lots more Sooty Thrushes alone

After 7:01. See *After* fly out of scrub. Silent. Then see pair of Thlypopsis in scrub which *After* has just left. Ranging 3-5 ft up. Silent. Definitely alone now. (I presume that this *After*-Thlypopsis group will have to be classified as a mixed flock, for purposes of statistics, but it probably was "coincidental".)

8:09. See single Trinellus. Silent and alone. 3 ft up scrub edge ravine. CORRECTION: There is a pair of Trinellus here. They move off thru scrub. Nothing follows or joins.

8:14. See single rufinucha. Silent & alone. 2 ft up in scrub.

NOTE: I have seen a lot more Sooty Thrushes alone than I have bothered to record above.

See single Yellow Grosbeak alone Perched 10 ft up in conifer

8:35. See pair of White-throats low in scrub ravine. Probably

same pair seen earlier. Still silent and alone.

8:46. See single Firebelly alone. 4 ft up in Eucalypt in scavine scrub. Rather noisy.

9:21. See single maroon crested catanga. Silent and alone. Low in hedge.

9:33. See single B. nigrocapitata. 3 ft up in scrub. Silent. Also see single Atter in scrub 10 ft away. Warbler moves on. Atter does not follow.

March 14, 1966
Atacaso

Going to work above San Juan this morning. Area where I worked in previous years. Arrive 5:50 a.m. Just starting to get light. Sky partly cloudy. According to my altimeter now, the altitude here is 11,100 ft.

Everything is very quiet now.

Hear first bird sounds (clawatores) 5:52 a.m. Followed by a few thrush sounds. Then a somewhat greater variety of songs and other noises.

NOTE: The vegetation around here is rather "patchy." But quite a lot of it looks like mature AS. And up here we are at the head of a valley which has quite a lot of nice forest in it.

6:14. See pair of rufinuchas. Ranging 4-6 ft up in AS. Uttering lots of PN's. Definitely alone.

6:27. See pair rufinuchas. 1-3 ft up low scrub edge Paríamo. Probably same pair seen earlier. Very noisy. Lots of greetings. Greetings very elaborate:

Twitter - R - "Zee weah weah weah" type series
 Length of phrases somewhat variable.

Is this Diglossini-like ZPPP

This pair definitely is still alone.

Then see single hummingbird XVII. Silent and alone. Feeding tubular white flowers. (Same species on which it was seen to feed a few days ago.)

6:35. Thrushes really are very dull here.

See some single sooty thrushes alone.

6:47. See same pair of rufinuchas. Still where they were. Still a little. Now uttering "PN"s, 1-3 ft up in scrub.

6:51. See single CC. Silent and alone. Perched 3-6 ft up in dead bush. Looks quite dull (brownish gray) underneath. (But certainly not bluish gray). Flies off immediately.

Then hear some Twitters in distance. Can't tell if they are CC or hummingbird. But certainly completely overlapped by rufinucha song. Then Twitters stop.

6:53. See single Laf. Perched exposed 6 ft up in AS. Silent and definitely alone.

7:02. Some rufinuchas still singing. NODWAH

SEE ALSO TODAY'S NOTES ON MIXED DIGLOSSINI

7:55. Hear Dubana singing down hill.

8:13. See another pair of rufinuchas. 2-6 ft up in AS. Definitely alone.

8:17. Twitter along path. See another, single rufinucha alone 2-4 ft up in scrub. Uttering "PN"s.

8:41 a.m. Single Firebelly flies by. Definitely alone
 leaving 9:40 a.m.

March 17, 1966
 Road to Baza.

Going to try to go past Papallacta today, on the road to Baza.
 Finally arrive region 7870 ft. 6:20 a.m. Quite light. Patches of
 fog drifting by.

Area of mixed (AS - USTF) and pasture

Hear matches of what is either Lajon Whitestart Song in dist-
 ance. NODWAH. Also Firebelly sounds. Also B. microcratus sounds.

Pair of Firebellies flies by overhead. Alone.

Also see single Whitestart flitting from bush to bush. Apparent-
 ly alone.

Obviously, from sound, there are lots and lots of birds here!

6:24. Area very mixed scrub & forest. See definite mixed flock.
 2 Whitestarts and 2 Whitestripes. Ranging 6-15 ft up in trees. Whitestart
 to j ———> Whitestripes Whitestripes j ———> Whitestarts. Both sp-
 ees noisy. Whitestarts Sing. NODWAH.

I also hear some Atlapetes greetings 30 ft away. But Atlapetes
 apparently do not follow flock.

Then see single Yellowbelly. Perched 20 ft up in tree, 40 ft from
 flock. Then flies away. Goes past flock without any indication of joining.
 I.E. this Yellowbelly is alone.

Walking along path, hear more Whitestart Song NODWAH

Bird sounds less numerous by 6:45 a.m.

6:50 Hear Dulcinea songs in distance.

Then hear lots more Whittent Long. NODWAH.

Then see single Whittent. Select. Definitely alone. 3-6 ft up in scrub edge pasture.

There is light rain, fog, and wind all together now. 7:00 a.m. Obviously all the birds are keeping under cover as much as possible.

Still more Whittent Long in distance 7:10 P NODWAH.

See a single Sooty Thrush alone.

7:15. See single pair *Basileuterus* - or *Hemiprocne* - types 3 ft up in second growth scrub edge pasture. Probably Whittentapes. (But possibly same species as "Black-check" seen above Papalluta.) Definitely alone at first. But then they go further into scrub. And then I hear *Atlapetes* PN's from this new area.

7:19. Hear some *Atlapetes* Whittle Long in distance. NODWAH.

7:21. Not far from where mixed flock seen earlier. See what is large mixed flock again. Includes pair of Whittentants, 2 Whittentapes, 2 Flycatchers *IV*, and 1 or 2 Forkbellies. All moving around 6-20 ft up in trees. All moderately noisy. But I can't tell who, if anyone is leading.

NOTES. ① Identification of Forkbelly (ies) definite. I.E. this is one of the few places where Forkbellies and Yellowbellies overlap.

② The flycatchers *IV* undoubtedly were with same flock when seen earlier this morning. (I didn't mention them because I didn't think they were "relevant".)

③ The Whittentapes here seem to have definitely gray cheeks (and probably caps). I did not notice this in the Whittentapes seen above Papalluta last week.

④ Once, a Forkbelly flew 40 ft away from flock. Nobody followed. Eventually, Forkbelly flew back and rejoined flock.

Rain almost stopped 7:35 a.m.

Go on down road to 9400 ft 7:40. Region rather similar vegetation. Very quiet. Rain coming back.

See some more sooty Thrushes alone.

Wind really is enormously strong 8:00 a.m.

Go on down side path to 9150 ft. See single Yellow-belly. 3-6 ft up second growth scrub edge old pasture. Uttering PN's and song. But definitely alone.

NOTE: Population of Yellow-bellies here does not seem to be very large. Less dense than in Central or Western Cordilleras Colombia.

Then hear more Whistling Song. NODWAH.

Then see another Yellowbelly fly by. Definitely alone.

Go on down to 9100 ft, 8:20 a.m., without seeing anything more. So start back uphill again.

Hear quite a lot of *B. microcratus* Rfl's. Without being able to see the birds. But it must be a common species here too.

NOTE: Possibly the Firebelly does not occur as far down hill as here. Possibly the level 9800-9700 ft is the only place where Firebellies and Yellowbellies overlap (viz. Central Cordillera).

Go on down highway to 9625 ft. More mixed pasture and scrub. With VSTF up hill.

Speak of the devil! See single Firebelly (definite). 20 ft up tree edge pasture. Definitely alone. Then flies up into isolated VSTF tree. Still alone. Quiet throughout.

8:45. Going down hill thru pasture. Reach 9475. See single Blue & Black (definite) flying from tree to tree edge pasture. 10-40 ft up. Uttering CN's. Definitely alone at least part of the time.

Once lands in tree where there is sooty Thrush 25 ft away.

But the 2 species do not react to one another. Blue & Black flies on. Sooty Thrush does not follow.

Sitta Then see pair of *Sittas* in an isolated VSTF tree, which the Blue & Black joined, apparently without stopping. *Sittas* ranging 20-40 ft up. Picking insects off leaves. Also feeding on red and yellow flowers. Long, stem, tubular flowers. And definitely pecking at base of corollas.

NOTE: This species of flower is common all over Quito region now. I also have seen it in other parts of the Andes. But certainly none of the other *Drymenia*s around here have fed on it while I was watching.

Sitta These *Sittas* certainly are alone at least part of the time. While they are in this tree, I hear very long, fluctuating twitter coming from it.

Sitta This must, I think have been uttered by one of the *Sittas*. Presumably the song of the species. It may be significant that this was uttered while the birds were not in a mixed flock.

Sitta *Sittas* eventually fly off into another VSTF tree 100 ft away. Sooty Thrushes ———→ *Sittas* (!). Can't tell if the association is "coincidental" or not. Then all three birds disappear.

A few minutes later, see single *Trochilops*. Silent. Definitely alone. Feeding isolated clump scrub in middle of pasture. Ranging from ground (see!) to 2 ft up.

Still later, see pair of Blue & Black feeding in trees edge pasture. 20-30 ft up. Definitely alone.

Beginning to rain hard 9:05 a.m.

9:10 a.m. Only a little bit further down pasture see group of 3 *Altapetes pallidimucha*. Moving thru scrub 2-4 ft up. Then hear 4 wire or hummed noises same patch of scrub. Then hear B.

magnumtatus Offs also same patch scrub. Then a single Blue & Black fly into the 20-30 ft above scrub birds. I think that this must all be considered a mixed flock, but it certainly does not appear to be very highly organized or coherent.

Blue & Black fly off. Nothing follows.

Little It probably is significant that the fletts, who may be not far away, do not join this group!!!

Scrub birds drift off and disappear. A few minutes later, pair of Blue & Blacks fly into nearby VSTF trees. 15-30 ft up. Definitely alone - altho very noisy.

Rain stopped 9:28 am. Wind also is somewhat weaker. And everything becomes quiet all of a sudden!

Just 9:40. Hear more Taffogin distance. NODWAH Brief. Young back up toward road, see single Treblebelly. Flying from tree to tree. In second growth. 20-25 ft up. Definitely alone. See some more sooty Thrushes alone.

9:48. Again, see single Blue & Black fly by alone (As far as I can tell, there is only one pair of Blue & Blacks here)

W Then hear Diglossini Twitter in distance. Obviously Cy. NODWAH. Bird sings repeatedly. Invisible. But apparently fairly high in tree.

9:50. Up by road (9625 level). See definite mixed flock. In second growth scrub. Includes at least 1 Whiterant, 2 Whiter troopers (again, gray of chick very conspicuous), 1 Woodpecker TST, 2 Blue & Blacks. All birds very quiet. Blue & Blacks 10 ft up. All other birds ranging 2-8 ft up. Whiterant in lead.

9:58. Now see that there are 2 Whiterants with group Blue & Black j. —————> Whiterant

Also see single Dubonia with flock! Dubonia f. —————>

Whitetail Whitetrupe f → Whitetail repeatedly. Woodpeck

er CVI f → group repeatedly.

Blue & Blacks seem to have left group now.

NOTE: Again, it probably is significant that flocks are not with this flock.

Walking up road, see some more sooty Thrushes alone.
Leaving 10:10 a.m.

COMMENTS:

① I am not sure that the social behavior observed today was typical of the area or not. But certainly there was no great number of large flocks when the weather was bad!!!

② In general, this whole series of regions on the slopes of Antisana looks very similar to Purace. And, with today's trip, I have covered a series of environments roughly comparable to all the environments visited on Purace (with the exception of the lowest site on the wet, east side of Purace). And certainly flocks are fewer, smaller, and simpler throughout this Antisana region than in the equivalent areas on Purace.

③ There may be some difficulty in comparing some of my observations in different parts of the Andes because of differences in altitude. Thus, for instance, I have worked only at very high and moderately high altitudes in Central Ecuador. But there is one point that should be remembered in this connection. The vegetation of some or all areas here resembles the vegetation at somewhat lower altitudes in other (only northern?) parts of the Andes. (Note that the area worked this morning is far below the upper limit of AS!!!)

④ In general, this morning's observations confirmed one

of my previous conclusions. Some (not all) of the species which are important in mixed flocks in other parts of the Andes play similar roles in Central Ecuador. But they are comparatively rare here. (NOTE: I have been rather surprised not to see Pseudospingus or Butorampus eximia here. They must be very rare indeed!)

(5). I think that I have finally solved the whole problem of geographic variation in flock-formation.

Flocks certainly are correlated with frontiers. But probably only one type of frontier. Frontiers with the humid sub-tropical zone. Flocks do not seem to be particularly characteristic of frontiers with arid temperate zone, or arid lowlands, or humid Paramo.

Of course, it is obvious that species inhabiting scrub and forest of the humid temperate zone must stray into scrub and forest of the humid sub-tropical zone more frequently than they stray into any kind of grassland or arid scrub.

Thus mixed flocks seem to be characteristic of just those frontier areas where different faunas are likely to overlap and mix!!!!

This, and some other considerations, may help to explain or identify the principal advantages secured by the habit of forming mixed flocks:

At one time I thought that the principal advantage secured by most (not all) of the members of mixed flocks was added protection against predators — and that this was particularly important in very humid areas, where the flocks are most highly developed, because of poor "visibility" (dense vegetation, frequent rain, cloud, fog, etc.)

But it must be significant that mixed flocks are not particularly highly developed in dense, humid, vegetation near the frontiers of granland and Parámo. (Viz the areas just below Parámo on Atacaso, and the forest near Palca, in Central Peru.) This in spite of the fact that some of these areas seem to be just as humid (e.g. covered by fog as frequently) as other areas near the frontiers of the humid sub-tropical zone!!!

This indicates (indisputably, I think) that the principal advantage of "allo-gregariousness" is social, and connected with the mixing of flocks of different life zones. I.E. it will permit an individual straying into a new life zone to take advantage of the knowledge (of both food and predators) of the old inhabitants of this zone. (Similarly, it may facilitate learning useful information from "strays" from another zone. And, of course, it may also reduce hostility in areas where "strays" are likely to be encountered comparatively frequently.)

SEE ALSO TODAY'S NOTES ON MIXED DIGLOSSINI

Atacaso,
March 18, 1966

Going to work below San Juan again today. The lowest area worked previously. Arrive 5:30 a.m. Just starting to get light. Sky largely cloudy. Hear first miscellaneous bird sounds 5:55 a.m.

CORRECTION. We stopped at wrong place! Go on down to right spot. Arrive 6:03 a.m.

SEE TODAY'S NOTES ON MIXED DIGLOSSINI

Well! Well! Well! 6:15 a.m. See pair of Whitestarts 4-6 ft up

in scrub side road. One sings repeatedly NODWAH. Then Cy (!) appears in same scrub. Cy j —> Whitestarts. Cy silent. Then Cy supplants Whitestarts repeatedly. This does not look hostile. It is merely the result of the fact that Cy is following —> Whitestarts very closely. Whitestarts fly across road. Cy f —> Whitestarts (again).

Then Whitestarts move up hill thru scrub. Cy disappears from my sight. Probably left area. Then the pair of Whitestarts runs into a third ind. of the same species. A dispute breaks out. Lots of flitting around, 10-15 ft up. Also lots of song. NODWAH. Then a pair of ^{white} Litties shows up in scrub. Ranging 10-20 ft up, 3-30 ft away from Whitestarts. A single ^{white} Finch also shows up. Perches in tree, 10 ft up, near both Litties and Whitestarts. Then Finch disappears. Litties stay around for a minute or so. Then fly off into distance. Apparently no one follows.

These "assemblages" must be classified as 2 flocks. But neither could be characterized as "highly organized." (They appeared to be the result of the usual "tentative early morning mulling about.")

NOTE: When these Whitestarts moved up hill, they passed right by a bird uttering DC (presumably atropileus) without pausing for a moment. Thus, the DC-ing bird should not be considered a member of the flock.

6:30 am Some distance up road. See single Blue + Orange and single rufinucha together, 3 ft up roadside scrub. Quiet. Then Blue + Orange flies across road. rufinucha f —> Blue + Orange. Birds gradually moving uphill. In direction of a pair of Whitestarts singing (NODWAH) 30-40 ft away. Then Whitestarts suddenly fly down hill. Whitestarts j —> group. All birds feeding low in

scrub. Then a second Blue & Orange appears. The 2 Blue & Oranges flit about, apparently chasing for some seconds. Then settle down peacefully close together. Then Whitestarts fly down hill. rufinucha f —
 → Whitestart.

This leaves Blue & Oranges alone, temporarily. Then group 3 Uromyias j — → Blue & Oranges! Blue & Oranges still low in scrub, 1-6 ft up. Uromyias 10-12 ft up small trees.

Then Blue & Oranges fly down hill. Obviously joining → Whitestart-rufinucha group. This leaves Uromyias up hill alone.

NOTES: (1) The Uromyias here probably are less "allogregarious" than those of the Central Cordillera of Colombia.

(2) If the rufinucha do play a specialized role in flocks here, they are followers, i.e. active nuclear. But, I seem to remember that they were passive nuclear in some parts of the northern Andes. Thus, the variation within this species may be much the same as in the BCBT.

7:01. Walking up road. See 2 B. nigrocrinitatus. Very noisy. Lots of Rfl's. About 10 ft apart. 2-4 ft up. Both definitely alone.

Bird sounds beginning to decline by 7:12 a.m.

7:21 See pair Uromyias 2-10 ft up roadside scrub. Both noisy. Apparently alone. (Altho I can hear both Whitestarts and nigrocrinitatus not awfully far away.)

NOTE: There are lots of Quans around here. Which suggests that there has not been much hunting here.

See some single Sooty Thrushes alone.

7:41. See single rufinucha j — → group of 2 or 3 flycatchers in second growth scrub. rufinucha ranges 1-3 ft up. Flycatchers 2-6 ft up. Flycatchers noisy. Lots of R's. rufinucha silent. Then flycatchers appear to be CV — the species seen below Papallacta yesterday!

Go on up to 9423 ft. Everything dead quiet 7:55 a.m. Starting
of back down road again.

Sun beginning to reach this area 7:57.

COMMENT: I see no little late in the morning around here
that I think that a large part of the local avian fauna has assembled
into flocks and gone uphill or downhill.

8:13. Speak of the level! See group of 3 ^WGT's moving rapidly
by uphill. 6-10 ft up in scrub. Uttering nasal "co" sounds. Definitely alone.

A minute later, hear Big Buttraps whistles far down hill.
Then see pair Big Buttraps flying from tree to tree. 20-30 ft up.
Definitely alone. Not following route taken by GT's earlier.

Then see single Trachypterus. Perched silent and alone 25 ft up in
tree.

8:21. Hear Dubura song down hill.

Down by car, see another single Trachypterus alone 6 ft up in scrub.

8:33. See pair ^WGT's. Ranging 6-15 ft up thick scrub. Quite
noisy. At first definitely alone. But then single Trachypterus is ———→
GT's. The 2 GT's do not stay close together. Ranging from 2 to 50 feet
apart. (This may be characteristic of the pairs of this species.) Then see
single Myiarchus ———→ group. Then I see that there is also a ^WGT
in neighborhood (dull colors, black bill).

Some distance further down road, hear torquatus Whistles.
NODWAH.

8:38 a.m. Large region bamboo scrub, with a few scattered
VSTF trees, below where car is parked. See pair ^WGT's fly into tree. Land
25-30 ft up. Feed on white berries. Then single maroon breasted cotin-
ga lands right beside GT. Stands with crest erected and spread. Then
attacks GT. A vicious peck. GT flies off some yards. Then cotin-
ga

flies off to chase the other GT. GT just keeps retreating, but stays in same tree. Then a group of 3 ^{WV} Blue & Blacks (definite) f —————> group P.

Then pair of GT's flies off. Nothing follows. GT's must be considered "alone" now.

Then 1 Blue & Black flies far away in opposite direction. Also must be considered alone now. Other 2 Blue & Blacks stay in tree. The Cotinga does not attack them, even though they seem to be feeding on same type of berry as the GT's earlier!!! Then I see that there is also a huge warbler quite near the Blue & Blacks. Apparently Black burnian.

Eventually the two remaining Blue & Blacks fly off in same direction as first. Nothing follows.

9:02. See pair of All-rufous *Synallaxis* moving thru mixed bamboo scrub. Ranging 4-6 ft up. "Tree-creeper". One outburst of noise (reaction to me?). Otherwise quiet. Apparently quite alone.

Light rain starts off 9:10 a.m. Stops 9:16.

9:25. See pair *Thromyces* 4 ft up in bamboo scrub. Fairly quiet. Apparently alone.

9:32. Near car (and where fitties seen earlier this morning). See definite mixed flock. Uphill. Region very mixed scrub and forest, with some bamboo. Group includes 2 ^{WV} Whitestarts, 2 ^{WV} *Thromyces*, 1 ^{WV} *Scrubbelly*, 2 ^{WV} *rufinucha*, and 2 ^{WV} *Plush-capped Finches* (definite)! *rufinucha*s and *Plush-capped Finches* stay fairly low, 4-10 ft up. Other species range 10-30 ft up. All very quiet. Except Whitestarts which sing occasionally (NODWAH). Whitestarts in lead most of the time. *Thromyces* f —————> Whitestarts repeatedly. All other species f —————> group repeatedly. Only once, is the *Scrubbelly* in lead, briefly. Whitestarts f —————> *Scrubbelly*. ADDITION: Now I see that there

are 2 *Arremonops* with group.

When group first appears, a pair of *B. nigriventris* down hill in bamboo scrub, begins to utter R's. Then gradually move up hill toward group. Then 1 *nigriventris* → group. The other moves away from group! (Was this "joining" actually "escorting"?)

NOTE: There definitely are no flocks with this group.
Leaving 10:00 a.m.

COMMENT: Until this morning, I thought that mixed flocks probably were more common around Papallacta than below San Juan. Now I am not so sure!

If flocks were more common around Papallacta, this could be easily explained. Humid temperate fauna of the eastern slopes should have more extensive frontiers with humid subtropical fauna.

If flocks are not more common around Papallacta, why not???

March 17, 1966
Hono

Going to work on path above town. Actually, we have a little trouble finding it. But eventually arrive 6:03 a.m. Quite light. Clear up here. Fog in valleys.

6:14. See single *Arremonops*. Perched 6 ft up in Eucalypt. Scags ignores Scag 10 ft away. This *Arremonops* should be classified as alone.

6:31. See a single *rufinucha*. Perched silent, alone, 6 ft up.

6:33. See a single *Troglodytes* alone.

Then see pair of *rufinucha*s moving thru scrub 3-12 ft up. Very noisy. Lots of greetings. Long R's, "Whush" Notes, semi-

Sanctus. Birds definitely alone.

Going down path, see another single bird definitely alone. Also feeding on mistletoe.

7:02 a.m. See 2 B. microcrinitatus 4-6 up in scrub. Very noisy. Possibly disputing. Certainly alone.

More sooty thrushes alone!

Further down path, see another B. microcrinitatus alone.

7:12. See a single Th. cyaniceps. Silent and alone. Feeding small fruits in tree, 10 ft up.

Going back up road. 7:55. See single bird definitely alone. 30 ft up in Eucalypt.

8:15. See another B. microcrinitatus alone.

8:37. See another rufinucha silent & alone. 6-10 ft up in scrub.

SEE ALSO TODAY'S NOTES ON MIXED DIGLOSSINI

March 20, 1966
Atacaso

Going to work below San Juan again. Same place worked day before yesterday. D.E. the lowest area visited. Arrive 5:55 a.m. Starting to get light. Sky clear. Patches of fog, which were in valleys earlier, seem to be lifting now.

Bird sounds have already begun. DC starts 5:57

6:10 a.m. Same place where flock with fittis seen day before yesterday. There is a single atropileus (identification definite) uttering DC in bamboo scrub. Ranging 3-10 ft up. Definitely alone. Then a pair of Whitethroats appears. About 50 ft downhill. Alone. Gradually move up toward atropileus. Ranging 6-15 ft up in scrub. Eventually,

Whitetails \rightarrow atropileus. Flitting about very erratically. Sometimes close to atropileus, sometimes 20-25 ft away. B. nigrocrinitatus song occasionally. Noisy but completely overlapped by atropileus D.C. Then pair of Firebellies \rightarrow group Range 6-20 ft up in scrub. Then group starts to move off. atropileus \rightarrow Whitetail. Then I lose sight of birds. This certainly is a flock, but probably not a highly organized one.

Going to start walking down road 6:25 a.m.

See single B. nigrocrinitatus. Apparently alone. 3 ft up in bamboo. Rather quiet.

Then see single Sooty Thrush alone.

Further down road, see a pair of nigrocrinitatus. Definitely a couple. Ranging 3-4 ft up in bamboo. One ind. utters Rfl's.

6:42. See a pair of Firebellies 10-15 ft up small tree edge bamboo scrub. Quiet. Alone.

* Some distance further on, see single Synallaxis-type 2 ft up in bamboo. Apparently medium dark gray all over. Silent. Alone. Could this be juv. All-scarious ???

Reaching region of thick but obviously second growth scrub.

6:48. Everything dead quiet here.

* Go on down to 8990 ft. Then see pair rafinchias. Ground to 2 ft up edge road. Definitely alone.

NOTE: This area looks very humid. Lots of bamboo. But also a few patches VSTF left.

W 7:30 see single Firebelly perched 4 ft up in scrub. Silent. Apparently the "outlier" of a not very coherent flock. I can hear flycatcher (s) about 15-20 ft away. Also see a single Cy, 10-15 ft up, sa

in general area. Also see single Whitestart same general area. Cy flies on. Nothing follows. Other birds just seem to disappear. Presumably gone downhill.

Go on down to 8870 ft 17:50. Then start up road again.

Heard some more Whitestart songs. NODWAH.

Am beginning to reach this area 17:58

8:06 Same area where Cy-Whitestart-flycatcher flock seen earlier. See 2 Wronias flitting about, 2-6 ft up in scrub. These presumably are the birds that were with flock earlier. But now definitely alone.

8:27 8950 ft. See pair of ingrocrutatus in bamboo scrub, 4-10 ft up. Silent. Definitely alone.

See a single sooty Thrush silent and alone.

8:45 9010 ft. See group 3 Big Butorapis flying from tree to tree. Definitely alone.

Litti Then see group of 3 Whitestarts 2-6 ft up in poor scrub on rock slide. Also alone. Then pair of Litti appears. Coming from far down hill. Land in small trees, more than 50 ft from Whitestarts. I.E. they must be classified as alone now. Picking insects off leaves in usual way. Then Litti of Whitestarts. Then one Litti flies away.

Litti Far across valley in one flight. Nothing follows. And I don't see that there are any other birds in the tree in which this Litti eventually lands. I.E. this Litti must be classified as alone again. A few minutes later, the other Litti leaves the Whitestart group. Goes from tree to tree in short hops. Probably heading in direction of its companion. The Whitestarts do not follow this Litti either. And certainly there are no other birds in the trees visited by this Litti. I.E. this Litti also is definitely alone again.

COMMENT: It now seems very probable that the Litti of this re

gon occur by themselves alone more often than the flocks of other regions and/or tend to occur in much "looser", more distant, innovations with other species !!!

A few minutes later, ca. 9:03, a pair of ^{W/H} Big Buttrorpes (re) appears. Feeding 20-25 ft up in trees. Often quite widely separated from one another. At same time, I also see single Firebelly 75-100 ft away low in scrub. There is no overt reaction between the 2 species so I shall have to class them both as alone. Altho I shouldn't be at all surprised if the behavior of the Firebelly is being influenced by the presence of the Big Buttrorpes.

* Cloud cover has come up 9:10 a.m.

9:20. Ca 9175 ft. Not far from where first Albi type R's heard earlier this morning. See definite mixed flock. Unfortunately silhouetted against sun. But group includes at least 2 or 3 Whitestarts, 1 or 2 Basileuterus or Thomomys types (almost certainly Whitestarts), 1 Uromyza, 2 Blue & Orange, 1 Firebelly. Presumed Whitestarts in lead. Followed by Uromyza and/or Whitestarts. But Whitestarts disappear after a few minutes. Blue & Oranges f —————> group repeatedly. Firebelly f —————> group repeatedly. Firebelly always or almost always bringing up the rear.

Firebelly usually 6-10 ft up trees. Blue & Oranges usually 2-4 ft up in scrub. Presumed Whitestarts and Uromyza usually 6-10 ft up in scrub. Whitestarts ranging 10-20 ft up.

Group as a whole very coherent. But quiet.

^{Albi} At one time Albi ♂ (identification definite) appears right in middle of group. Silent. 2 ft up in scrub. Then flies away. Nothing follows. Then Albi ♂ flies back to group !!! Still silent. Ranges 2-4 ft up. Then disappears again.

Group as a whole gradually moves up hill. Lost to view.

Sitta NOTE: This is less than $\frac{1}{4}$ mile from where *Sittas* seen earlier. I & if they had been looking for a flock, they could have found one without much difficulty.

Sitta COMMENT: It is possible that the *Sittas* here are breeding (note the separation of the 2 birds this morning). But surely they must also have been breeding in some of the other regions during my periods of observation ???

9:40. A few yards further up road site where All-rufous - *Synallaxis* civ encounter was observed some days ago. Hear a lot of furnariid type sounds. Possibly a dispute between same species. But unfortunately I can't see the birds.

* 10:00. Getting back up near car. Large area bamboo scrub. Hear Whitestart Song. NODWAH

Then see single *Fimbrella* fly by alone.

Fog starting to come in again. Leaving 10:30 a.m.

COMMENTS: I must get more counts! It is beginning to look as if a lot of species join flocks less frequently here than elsewhere, even when both the species themselves and mixed flocks are common here. Viz *Uromyias* and *Margarornis* as well as *Sitta*.

Ful
Aten It should be mentioned, in this connection, that some of the *Diglossas*, especially *Zaf* and *Ater*, also seem to "escort" mixed flocks less frequently here than elsewhere. This is further evidence that the habit of associating with other species has been selected against here. But I am not sure that I understand the disadvantages (for *Zaf* and *Ater*) here.

Could the explanation be as follows ??? A *Diglossa* "escorting" a flock probably always increases the attractiveness of a

flock and at the same time may "hurry" the other birds away.
 In regions like those of the northern Andes, the increase in attractiveness probably is relatively minimal. Simply because most flocks of these regions are (already) large and very attractive. But the increase in attractiveness might be much more significant here simply because most flocks here are not very large or attractive. Thus the disadvantages of "escorting" probably are greater here than in the northern Andes, while the advantages may be the same.

(Of course, this whole discussion is based on the assumption that these particular *Diglossa* species do not derive advantages such as increased food or protection from mixed flocks!!! And that they do not receive more advantages of such types in the northern Andes than down here!!!)

ADDITION: A thought has just occurred to me! I may have discovered another general rule! The species for which the principal advantage of joining mixed flocks is protection are usually brightly colored (e.g. the bright arboreal tanagers). While the species for which the principal advantage of joining mixed flocks is increased food are usually cryptically colored (e.g. flycatchers and dendrocolapts).

This would suggest that the bright species have developed the habit of joining flocks simply in order to get protection. (Of course, they could also get protection by becoming cryptic. But this might raise havoc in their intra-specific social reactions.)

Of course, a prime exception to this general rule would be provided by "dull neutral" passive nuclear species. But are there any species of this type in the Andes??? How about *Cnemoscopus*?

(Actually, I think Cnemidophorus may be both insectivorous and cryptic.)

Which brings up another problem. Why are dull neutral species comparatively rare or absent in the Andes????? Are the flocks here younger and/or less specialized than those of lowland Panama?????

March 21, 1966
Atacaso

Going to work in same area again today. Arrive site just above where Albi was seen yesterday 8:58 a.m. Just starting to get light. Dense and low cloud cover. Light rain!

6:16. See a couple of ^{iv} Toucanets 10-12 ft up in scrub. Alone.

6:32. See some single Scrub Wren alone.

SEE TODAY'S NOTES ON MIXED DIGLOSSINI.

7:05. COMMENT. So far, there has been no indication that mixed flocks become more common when the weather becomes bad here. In fact, rather the reverse!

This confirms the impression I received below Papallacta the other day. But today's observations probably are more significant. There has been no wind here today, while there were very strong winds at Papallacta the other day.

* Go on down to area where fitties seen yesterday. Arrive 7:14. There are a lot more bird sounds around here. Primarily wren songs. Also some Mutitart song downhill. NODWAN. But overlapping Wren song at random.

7:17. See pair of rufinuchas 2-6 ft up in poor scrub on

rock slide. Quiet. Apparently alone.

Then see single Blue + Orange 1-3 ft up in dense AS edge of an other part of the same rock slide. Also quiet. Definitely alone.

Rain much lighter now.

7:40. 9000 ft. Near (presumed) mixed Albe area. See group 3 Wronyas 4-10 ft up bamboo scrub. Heavy. Alone.

Then see pair B. superciliosus 4 ft up in bamboo scrub 25 ft away across road. Uttering Rfl's. Then also is (are) 1 or 2 small Contopus-like flycatchers in tree near warblers. But the 2 species go in different directions. I & these superciliosus should be classified as alone.

Going down road 8:32. 8700 ft. See group of 2 All-rufous Synallaxis and 1 torquatus (see !!!). All very close together. 2 ft up scrub. Unfortunately, they begin to "mob" me. So I can't tell how coherent the group is or who is leading.

Rain worse again 8:25.

8:31. 8475 ft. Region very poor mixed bamboo scrub edge road. See group 3 Wronyas 4-8 ft up small tree. Also 2 rufinuchas 2-3 ft up in scrub very nearby. Then Wronyas fly into tree 20 ft away. rufinucha do not follow. Then group of 4 Wronyas appears. Ranging 2-10 ft up. Whitstart g. → rufinucha. Whitstart sings. NOBWAH. Then group starts to move uphill. rufinucha g. Whitstarts repeatedly. Whitstart g. → rufinucha repeatedly. Then rufinucha f. → Whitstarts. Then the Wronyas turn around and f. → group. This must be classified as a coherent flock.

8:47. slightly further down road. Region mixed bamboo scrub. See another mixed flock. 2 H. atropileus and 2 Black-capped Todies (both identifications definite). All birds moving 2-4 ft up. H. atropileus

very noisy. Pluck-capped Gnatcatcher f ———→ atropaceous repeatedly.

Rain almost stopped again 8:53 a.m.

Go on down to 8450 ft. Then start back up again 9:02 a.m.

Just as I start to go, I see a very large and very diffuse flo-

ck. Scattered in large VSTF trees, at least 100 yds apart. Group inc-
ludes at least 2 BYB's (1), 4 Blue & Orange, 2 or 3 GT's (one juv.),
1 Firebelly, 1 Whistler, 2 Bantamers or Hemispermis types, and 2
Cyp. Possibly others. Most birds quite noisy. Cys fong repeatedly. NOD
WAT. The Blue & Oranges and the GT's fly back and forth across ravine.
The others stay on one side or the other. (Actually, the BYB's are on one
side, and all the other species on the other side.) All birds visible rang-
ing 20-40 ft up. Group as a whole doesn't seem to be making any prog-
ress in any one direction.

I see a few unmistakable reactions within the group. GT's f

→ BYB's. Blue & Orange f ———→ Firebelly repeatedly.

NOTE: There may be two partly-segregated types of more la-
borate flocks in this region. ① the "bamboo flocks". ② the "VSTF
tree flocks".

NOTE: As far as I could tell, there were no fittis in this flock.
I looked for them particularly carefully.

9:35. Rain quite stopped now. And sun is dimly visible thru
clouds! Birds in general very quiet.

9:40 8850 ft. A group of 4 All-rufous Sturnella flies across
road. From bamboo scrub to mixed second growth. Definitely alone.

9:48. Some distance further on. See single Firebelly alone. 2-5 ft
up in scrub.

9:58. 8950 ft. Come across large flock which may be partly the
same as large flock seen earlier lower down. Now includes at least:

also 1 Spotted Thrush, and one
Red-bellied Noddy!

1 BYB, 1 GT, 2 Arremonops, 1 Blue & Orange, 2 rufinucha, 1 Basilinna
 or Thraupis-type, 2 Setts. All birds quiet. Group as a whole coherent.
 All birds hanging 2-10 ft up scrub very steep slope. GT and Basil.
 or Thraupis-type also go up into tall VSTF tree

Can't tell who is leading. Lead probably changing. BYB bringing
 up rear. Blue & Orange also usually rather far back. GT and Setts
 usually near front

ADDITION. 9:07 I can hear Whitethroat singing in group some
 where. NODWAH. Now see bird. 30 ft up VSTF tree.

COMMENT. Now it would appear that flock formation is pos-
 sibly a sign of good weather!

10:23 9100 ft. See pair of rufinucha's low in scrub on old slide.
 Probably same pair seen earlier this morning. (Still) alone.

Then see single rufinucha, also alone, 40 ft away.
 Leaving 10:35 a.m.

March 22, 1966
 Atasco

Going to work same area again today. Arrive with above toward
 end of presumed second Albi 5:57. Just starting to get light. Heavy cloud
 cover but no rain.

SEE TODAY'S NOTES ON MIXED DIGLOSSINI

6:27. See single rufinucha alone. 2 ft up in sparse scrub.
 Then see group 3 Big Butor down hill in trees. Flying but
 apparently alone.

See some Sooty Thrushes alone.

Also a pair of B. macrocratus alone 2-4 ft up in bamboo.

Going down road 7:35. See single Wronyas. Near. Perched 4-6 ft up. Bamboo scrub. Definitely alone. NOTES: (1) This bird is not very far from large mixed flock (described in Diglossini notes) which also included Wronyas. But it shows no tendency to join or fall out flock. (2) This bird definitely has "background" color of chin and throat whitish, "background" color of throat and breast yellowish. I.E. it is exactly like the birds of the Central Cordillera of Colombia.

COMMENT: The Green and White hummingbird must be one of the species which derives protection and little or nothing else from mixed flocks. I have never seen it feed on anything except flowers while it was with a flock. (The bird with flock seen earlier this morning was feeding on bromeliads and a species of pink tubular flower which the local Diglossas apparently do not touch.)

7:51. Hear more Whitestart Song NODWAH. Stops. Then hear 4 songs downhill. NODWAH. Stop. Hear more Whitestart Song. NODWAH. Stops. These species also seem to be inhibiting egg-eating rather well!

8:00 am 8900 ft. See another group of 3 Wronyas in bamboo scrub. Ranging 3-10 ft up. Near but definitely alone.

Am reaching this area now.

See a group flying thru scrub uphill. Includes 2 Forbellies and 1 ind. of another species (quite possibly Dubuna).

Everything very quiet now 8:15 am

8:27. 8480 ft. See single Grey and White hummingbird. Alone. Suddenly it is attacked by another ind. of the same species! Both fly off. (One of these inds. at least, appeared to have whitish or grayish forehead. Dust or pollen.)

8:31. A single bird flies by. Definitely alone. It appeared to be Cramolencia albiceps!!!

Go on down to 8750 ft. Then start back up road 8:34
Clouds coming in again.

Just a few feet up road, single Fundulus flies by alone.
Then see some sp. flycatcher flycatcher alone.

9:01. See pair B. nigrorotatus noisy but definitely alone. Range
ing 2-3 ft up scrub side road. Then see another nigrorotatus 10 ft
up in scrub across road. Also noisy and alone.

9:11. 8710 ft. Come across definite mixed flock. Moving rapidly
down hill. Only see birds as they are passing thru very low scrub along
edge road. Fortunately, I can see precisely the order of progression of the
flock. First comes 1 All-rufous Synallaxis, then 2 Finchbills, then 2
more All-rufous Synallaxis, then 2 Whistlers, then 2 White throats
(one, at least, of these birds had grayish black, but, apparently, brownish
crown), then one Sette, then one Albi ♂ (sic!), then one Blue & Orange.
All these occurred in a tight coherent group. Moderately noisy. All
ranging 2-6 ft up.

Then the All-rufous Synallaxis discover me and begin to "no-
b" very noisy. This alarms all the other birds. Good evidence of the pro-
tective value of Allopreziousness. Some of the birds scatter.

At about this time, 3 large dendrocolaptes appear in group.
I can't see where they come from. VII. (I am sure I have seen this
species elsewhere in the Andes; but I can't remember where.) NOTE:
This may well be the species which I thought was Oranolenca when seen
earlier this morning!!!

The Albi ♂ presumably doesn't stay with flock very long.
Within a few minutes, I hear Albi-type R's about 30 ft away. This
may be further evidence that the "exorting" by Albis is fundamentally
hostile.

8m COMMENT. It must be significant that "exerting" by *Diglossas* is common only in this area, where mixed flocks are evolutionarily highly developed (see below).

8m It also is significant that Ays do not seem to join flocks very frequently here (altho the local population of Ays may be quite substantial).

Finally, after a considerable delay, ^W2 GT's join group. Then whole group moves down hill and disappears.

COMMENT: I am beginning to think that *Alloreganousness* is as well developed in this particular small area as in the Sierra de Nevada and the Eastern Cordillera of Colombia!!!

9:45. A little further up road. Single *Tringas* fly alone.

Then see single *Tringas* alone in bamboo scrub.

10:01. 9025 ft. Region mixed bamboo scrub. See single *Tringa* as alone one side road. Also pair *B. nigrocrinitatus* alone 30 ft away on the other side of the road.

Leaving 10:00 a.m.

COMMENTS:

It is obvious that *Alloreganousness* increases as one goes downward along the road below San Juan. Compare observations at different "stations", i.e. around 10,850 ft, around 10,500 ft, around 10,000 ft, around 9350 ft, and around 9000-8750 ft. This increase is more or less gradual — altho there may be a sudden "jump", a disproportionate increase, when one gets to the 9000-8750 ft. level.

Flocks are not only common at this lowest level, but also comparatively varied. Around 10,500 ft, for instance, I saw only one large highly organized flock (*Sitta*, *Margarornis*, etc.). Around 9000-8750 ft, however, one sees a variety of highly organized flocks.

(flocks "built around" brightly colored arboreal tanagers, flocks following *H. atripennis*, or the All-rufous *Synellaxis*, etc.) Probably many birds move from one type of flock to another. But certainly, two or more different types of highly organized flocks are sometimes synchronous at this lowest level!

This increase of Allogregariousness with decreasing altitude supports my hypothesis that such gregariousness is an adaptation to life near a humid frontier with the Upper Subtropical Zone.

Certainly, the increase of Allogregariousness is not directly correlated with any (other) obvious factors of the environment. It is not directly correlated with humidity. (The upper reaches of this valley, ca 10,850 - 11,000 ft are more humid than the lower levels, simply because they are more often in cloud.) It is not directly correlated with tallness, maturity, or apparent richness of forest. (The forest around 10,500 ft and around 9,350 ft seems "better" in all respects than the forest ca 9000 - 8750 ft.) It probably is not directly correlated with density of population, i.e. number of birds per square foot. (The population of birds of species that join flocks does not seem to be more dense at 9000 - 8750 ft than at 9350 ft.) Nor does it seem to be correlated with number of species present. The number of species present seems to be approximately the same at 9350 ft and at 9000 - 8750 ft. (The 9350 ft level has some species, e.g. Laf and Blue and Black, which apparently are lacking at the lower level. While the lower level has some species, e.g. the BYB and Basileuterus coronatus which apparently are lacking at the higher level.) And certainly the species which are most important in mixed flocks are identical at both levels!!!!

It is particularly significant, therefore, that the lang-

ent increase in *Allogregariousness* occurs at the exact same level, 9000-8750 ft, where some species of a definite "sub-tropical aspect" (i.e. the BYB, *B. coronatus*, and possibly *deudroclaptus* CVII) first appear!!!! (I might add that these "sub-tropical" species are not more gregarious, per se, than many of the species of higher elevations.)

ADDITIONS:

① The 9350 ft and 9000-8750 ft levels are less than 1/2 Km apart by road.

② The vegetation of the 2 areas is similar. Except that the 9000-8750 ft level has even more extensive patches of bamboo. Usually, in other areas, an indication of impoverishment.

③ It is probable that some of the "facultative" members of mixed flocks (such as *rufinucha* and the *Touillie*) occur relatively more frequently in mixed flocks at the 9000-8750 ft level than at the 9350 ft level.

March 23, 1966

Atacaso.

Going to work same area again today (i.e. the "9000-8750 ft level"). Arrive 5:54 a.m. Clear. Relatively cool. Getting light.

NOTE: The car is parked just above the second Albi territory. And this is 9200 ft according to my altimeter now!

Go on up to area where Sittis were seen alone a few days ago. This also is near area where third Albi was heard singing yesterday. It is approximately 9220 ft according to my altimeter now. I shall use this as the upper limit for my special count of this "level."

See single Sooty Thrush alone

6:14 See single Blue Black Alone. 2 ft up second growth scrub. Then see single Sunbittern fly by alone

6:23 Walking down road. 9170 ft Not far from where H. atropileus flocks seen yesterday. Hear atropileus DC. Coming from second growth scrub. Bird probably perched 2-3 ft up in bush. Definitely alone. Then Litta flies into same bush. Perches 4 ft up. Probably 2-3 ft from atropileus. atropileus continues DC. Litta just sits quietly. Then flies away. atropileus does not follow.

Then bird flies into another bush bamboo scrub. Continues DC. Now I can see it well. Definitely atropileus. Then flies across road. Apparently joins mate in bamboo. Both birds noisy. Gradually move off. Apparently still alone.

6:35 a.m. Some distance down road. See pair Thromyias 4 ft up bamboo scrub. Noisy. Apparently alone.

Birds in general already noticeably quieter 6:37.

See some more Sooty Thrushes alone

6:42. 9090 ft. See single B. superciliosus uttering Rfl's 4 ft up in bush. Apparently alone.

6:54. Ca 9000 ft. See another pair Thromyias flitting about in scrub. Apparently alone.

Everything certainly seems dead today. Is it because of the cold?

7:01. 8910 ft. See a single Throchiloides alone 20 ft up bamboo.

7:15. Ca 8875 ft. See group 4 All-rufous Synallaxis. Region very mixed bamboo scrub. Ranging 2-5 ft up. Quiet. There also is a single rupestris in scrub 6-8 ft from Synallaxis. I can't see any obvious reaction between the 2 species, but I shall have to call this a mixed flock.

7:25. Go on down to lowest point usually visited in this area

It is just about 8805-8810 ft according to my altimeter now. So I should probably describe this area as the "9200-8800 ft level."

NOTE: All altitudes quoted in my notes this trip are uncorrected.

7:40. Place where All-rufous - rufinucha group seen earlier. ~~W/II~~ The All-rufous are still there. Ranging 1-3 ft up in bamboo. Quiet. Then a rufinucha \rightarrow All-rufous. Then single rufinucha appears in group. rufinuchas fly off across road. rufinucha \rightarrow rufinuchas. All-rufous do not follow. Then they start to "mob" me. Interestingly enough, this "mobbing" does not seem to attract anything else. All-rufous disappear alone now.

Then the All-rufous quit down. Resume feeding peacefully. And then a single torquatus \rightarrow All-rufous.

COMMENT: The All-rufous synallaxis may be parvic nuclea or here, whenever they are in mixed flocks.

A few minutes later, catch glimpse pair rufinuchas up hill. Probably same birds seen with All-rufous earlier. Ranging 3-6 ft up. Uttering PN's. rufinucha seems to have disappeared. But there is a double oculaptes CVI with the rufinuchas at first. Then rufinuchas disappear. Presumably move on. CVI does not follow. Alone now.

7:58. Further up road. See single Uromyza alone in bamboo (again). 10 ft up. Moderately noisy.

8:02. Still further up. See single rufinucha alone. 2-3 ft up in very poor bamboo scrub.

8:04. Sun beginning to reach this area. At last!

SEE TODAY'S NOTES ON MIXED DIGLOSSINI

9:02. Ca 9100 ft. Hear what sounds like Big Buttherams. For the first time today. Down hill. Starting down road again.

9:13 Near area where Cy-Fruebelly flock seen earlier this morning
 9:14 Near 2 Fruebellies in scrub. Then single Cy flies by. Possible forming the Fruebellies.

9:20. 8730 ft. See single Fruebelly 5 ft up dense scrub. Silent. App. moving alone.

Go on down to low point of area 9:45 a.m. Then start up again
 See an occasional bird fly overhead, without being able to identify it.

9:50. A little bit up road, hear what may be large mixed flock far across ravine. Too far away to see birds. But both Cy (3) and Whitestart (3) singing. Partly overlapping.

Then a single Green and White Hummingbird flies by. Silent. Definitely alone at this time.

Now I am beginning to hear more bird sounds all over the place
 9:58 a.m. It does sound as if flocks are assembling!

Then see single Cy. Alone. Silent 6 ft up in scrub. Flies across ravine, to where flock sounds are coming from! A single Big Buttercup fly —> Cy. And some brown bird (all-rufous ???) fly —> Big Buttercup. Looking over to where these birds land, I see a couple of green birds flitting about in trees. GT's ??? Also 1 Cyanocephala (definite). Also 1 Sooty Thrush! Then a single Blue & Black flies away from group. Nothing follows. Blue & Black must be considered alone now. But it must have been with group earlier.

I think that all these birds, up to and including the Green and White hummer, must be classified as forming a single flock. But a very diffuse one.

This may be partly the same as the very large and diffuse flock I saw in this same general area a few days ago.

10:15. Near first Duliana song of the morning.

10:28 am. 8750 ft. See single Green and White Hummingbird. Settle. Perches in scrub. Only, arrives from a small striped wren. When flies down into grass Green and White flies away.

10:44. Area where atropileus seen earlier this morning. See 5.
 Big Buttercupis In small trees and low in scrub. Very noisy. Lots of whistles, rattle-like patterns, and HAC-type Notes. Apparently disputing. One pair flies off in one direction. Group of 3 in another direction. Both groups apparently alone.

Leaving 10:55 am.

COMMENTS:

In general, the behavior of the birds here today was rather different from their behavior on previous days.

This must, I think, have been due to the cold. What seems to have happened is that some of the species which are important in mixed flocks left the area. Presumably they went to some warmer place. Presumably to some place in the Upper Sub-tropical Zone.

NOTE: The species that disappeared were all, or almost all, brightly colored tanagers. E.g. the Blue & Orange, the Big Buttercupis, the GT. Pombly also the Plum-capped Finch. The only 2 brightly colored tanagers that remained were the Towhee, and the Blue & Black. It probably is significant that these are the two species which seem to be least closely tied to mixed flocks.

Green
 Apparently, the Diglossas, bush-finches, bush-tanagers, and bush-warblers, did not move at all. Nor did the Whitestarts.

Setti
 Probably the Green and White Hummingbird moved with the brightly colored tanagers. Again, another "obligate" commensal!

I am not sure what happened to the Settis. Possibly the last Setti left after my observation of the atropileus - Setti "group".

It is only after the bright tanagers, and their associates, returned, in mid-morning, that a large flock was seen again.

This morning's observations would suggest that there are more species here, at 9200-8800 ft level, than at the "9350 ft" level. (The difference is due to the "Upper Sub-tropical" species here.)

There probably is a general rule that, within any given region, allogregariousness is most highly developed where the number of species is greatest. (Of course, this cannot help to explain the different degrees of Allogregariousness in different regions.)

There is a causal relationship here. Either allogregariousness is absent in some parts of some regions because certain particular species are absent from these parts. Or, much more probably, certain particular species are absent because they "need" to join mixed flocks and the formation of mixed flocks would be disadvantageous in these parts.

Certainly the whole of this 9200-8800 ft area is basically humid temperate. Thus I can only study the interaction of strays from the Upper Sub-tropical Zone into the Humid Temperate Zone here. I probably will have to rely upon my notes taken in Colombia and Venezuela for descriptions of the interactions produced when strays from the Humid Temperate Zone wander into the Upper Sub-tropical Zone.

It probably is significant that the most characteristic Upper Sub-tropical Species observed at this 9200-8800 ft level have been seen only with mixed flocks.

NOTE: I still do not understand why Atlapetes schistaceus (and A. pallidimucha) do not occur along this road below San Juan. It looks very much as if the local rufimucha have some

how been able to "take over" the "usual schistaceus niche" !!!

March 24, 1966
Atacaso

Going to work at "9350 ft bowl" this morning. Arrive 8:55 a.m. Starting to get light. Clear, cool, windy.

Car stops at usual site. This is 9410 ft according to altimeter now!

Watching usual *H. atripileus* uttering DC in bamboo scrub. Certainly alone at first. Then, as usual, pair of *Whitetails* gradually move up hill in general direction of *atripileus*. *Whitetails* singing frequently, completely overlapped by DC. *Whitetails* eventually \rightarrow *atripileus*. Then pair *Forbesii* appears in adjacent scrub, 6:15. I think that they must be classified as having joined \rightarrow group. But group certainly is not coherent (yet). Then *Whitetails* fly away. Nothing follows. And *Forbesii* seem to drift away in another direction. I.E. all 3 species should be considered alone now.

NOTE: In general, birds are quite noisy here this morning. Sounds as if breeding season were coming on.

6:26 a.m. Near car. See single Blue + Black. Silent. Apparently alone. Feeding low (2 ft up) in rather poor scrub edge slide.

Then see pair *Whitetails*. Moving thru scrub 6-12 ft up. At first alone. Then move up hill. *Whitetails* \rightarrow *Protonotars*. The 2 species stay close together for some time (altho they don't show anything else in the way of reactions to one another). I think that this must be classified as at least a temporarily coherent flock.

6:36. See single Blue + Orange. Silent. 2 ft up low scrub. Apparently alone.

Then see group ³ Big Butterflies. Up hill in tree tops. Very noisy. Definitely alone.

Starting up road 6:40 a.m.

See single Firebelly. Silent. Alone 6 ft up in small tree

NOTE: There is one point which I may not have stressed sufficient-ly in my comments yesterday. It is only where the Humid Temperate Zone meets the Humid Upper Subtropical Zone that species can pass zonal boundaries in response to changes in weather

6:50. 9460 ft. See single sooty Thrush alone

Then see pair Wronyas alone 6-10 ft up in bamboo scrub. (NOTE: the local Wronyas seem to have a definite preference for bamboo. Almost as much as the Pink-capped Gnat and atropis.)

6:58. 9500 ft. See mixed flock. Includes 2 ^W Whitestarts, 2 ^W Firebellies, 2 ^W Flycatchers (not definitely identified, but probably Wronyas), and one Blue & Black. Rather coherent. Whitestarts in lead. All birds ranging 2-15 ft up in scrub and small trees

Good heavens! Fog is approaching this area 7:08

7:10. 9515 ft. See single Blue & Orange. Silent. 2 ft up scrub. Also see single Firebelly. Silent. Also 2 ft up in scrub. But at least 40 ft from Blue & Orange. I.E. both birds alone

Also hear definite Laf song. NODWAH. Stops. Then Whitestart song. NODWAH stops

Some distance further on, see single B. superciliaris 2 ft up bamboo scrub. Definitely alone.

Then see single Whitestart alone

More Laf song in distance. NODWAH.

Some yards further on, see what are undoubtedly same Whitestart and same superciliaris quite close together. There also is a single Wronya

as only a few ft away. This must be considered a flock. Probably not coherent. And then, 10 ft further on, see another Wronia and a single White throat only 2 ft apart. Move on a few ft. Then a single Junco, a CC, and a magisteratus appear in same bunch! All birds 1-3 ft up. All quiet. All very close together. All obviously are members of same flock.

And flock is coherent. CC f → magisteratus

A few minutes later, and a few feet further on, hear unmistakable GT sounds. Possibly GT also is member of flock?

Then in same flock again. Still includes Whitethroat, 2 Wronia as, and magisteratus (one!!!) Also 1 Tit, 1 Rufinucha, and 1 Blue & Orange. And I see that there really are 2 Juncos with group.

This really is a very large flock for the region!!! I think it contains as many species as any flock seen down below, at the 9200-9500 ft level!

All birds low in scrub. And all birds still quiet. Group as a whole still coherent.

Whitethroat definitely in lead at first. But gradually moves so far ahead that it seems to become separated (at least temporarily). Must be considered alone at this time.

Blue & Orange and rufinucha associating particularly closely. Blue & Orange f → rufinucha repeatedly. rufinucha f → Blue & Orange repeatedly.

Fog lifting 14:50 a.m. Wind has dropped. Getting warmer.

NOTE: This area where particularly large flock was seen is 9560 ft. And it is covered with not very dense or rich-looking scrub!!! No OSTF near by!

Everything very quiet 7:55. Sun is beginning to reach area.

8:00 a.m. 9630 ft. See single Whitethroat alone.

alter?
Laf

Then in single humilis silent and alone
8:04. Further up road, hear another Laf singing. NODWAH. Then
see 2 Lafs chasing one another thru scrub. Finally \rightarrow Lafs!!!
The 2 Diglossas move on. Finally, does not follow.

Laf
alter?
Laf

Oh oh!!!!!! See same 2 Diglossas a few feet further on. Fly into
small tree. Perch 3-4 ft up. Now I see that one is definitely Laf. But the
other appears to lack humeral patches. Presumably Alter. The 2 birds hop
around nervously, only a few inches apart. No display or actual fighting.
Then Laf flies to perch a few feet away. Sings. NODWAH. Then shuts up.
Flies away. Then presumed Alter flies away too.

COMMENT: I think that this must have been a hostile interspecific
encounter.

alter
sym

It probably is significant, therefore, that the Alters here do not
seem to be in breeding condition. At least, not far advanced. It would
seem to be a general rule, here, that hostile interspecific encounters occur
only when one of the species involved (always Alter???) is not in breeding
condition!!!

sym

NOTE: This is an area which gets sun relatively early in the morn-
ing. Also there is an old slide here which is covered by relatively sparse
scrub. Both factors must favor Alter.

Black

NOTE: It probably is characteristic of inter-specific disputes that
they are not accompanied by display postures or movements.

Laf

8:25 am. Some distance further on, see another Black Diglossa.
Silent and alone. 3 ft up scrub. Probably Laf.

8:29 am. Reach 9400 ft level. Start back down road again.

8:34. Down where dispute between Laf and presumed Alter was
seen earlier. A single Laf flies by. Definitely alone.

8:52. 9525 ft. See group 3 White-throats feeding in tree-tops up here.

10. Apparently alone

NOTE: KM 30 post is here. I have made most of my observations at this "level" below this marker.

11. Near more Laf Long also NODWAN (Laf are singing quite frequently here.)

Further down road, again of Firebills. 6" - 1' up in scrub on cliff.

12. Quiet. Apparently alone

9:10. 9450 ft. see single Firebills alone. 10 ft up in tree.

A minute later, see mixed flock in scrub of ravine. Includes 1 Whitethrope, 1 Whitetail, 1 Uromyias, 1 Glycisther CV, 1 Blue & Orange. Uromyias in lead. Blue & Orange bringing up rear. 1 Firebills group. Then, apparently leaves again.

Interesting enough, I know that there are both Cy (s) and Laf (s) in the neighborhood. But apparently neither of these species forms a flock.

ADDITION: There is at least 1 rufopectus with group. Also a second Blue & Orange. And then 2 Settis appear. Associate particularly closely with Blue & Oranges for at least a few seconds.

Then a pair of Blue & Blacks flies overhead. Without joining flock. (No hesitation at all!)

A little further on, 9:34, see 3 Firebills alone.

NOTE: This level probably does have approximately as many species as the 9200-8800 ft level. The 9200-8800 level has the Green and Mute hummingbird, Ally, B. coronatus, the BYB, and M. cyanocephala. But this level has CC, Laf, Atter, and Glycisther CV.

Back to car 9:47. This is now 9400 ft according to altimeter!

9:50. Just a little bit below car. Come across another and quite different large mixed flock. Includes, B. macrostictus, at least 1

✓ Whitetail, 3 GT's, 1 Towhee, 2 Wrenwings. Also 1 Green and White
 e Hummingbird (the first I have ever seen at this level). And 5 or
 more probably 3 of the very large woodpecker ~~W~~, and at least 3
 All-rufous Tanager.

This flock is in area very mixed vegetation. All-rufous ranging
 up 6" - 3' up. B. nigrocapitata much the same. Whitetail ranging
 4-12 ft up. Towhee, much the same. Wrenwings 8-10 ft up. GT's 2-
 10 ft up. (GT's definitely feeding on fruit.) Green and White seen only 3
 ft up. (Feeding on same species pink tubular flower as yesterday.) Wood
 peckers ranging from ground to 4 ft up.

All species very noisy. Especially All-rufous, GT's, and wood
 peckers!!! Whitetail. Sing NODWAH. nigrocapitata utter Rfl's

I saw a number of reactions within flock. GT's → Towhee
 elly. GT's → Wrenwings. Whitetail's → B. nigrocapitata
 is. However, the flock as a whole did not appear to be very coherent.
 Birds often widely dispersed.

10:22. Same area. Near torquatus Whistles. NODWAH.

10:30. Go on down to 9300 ft. This is the bottom of this level.
 (Now what I have been calling the "9350 ft level" should really be the
 "9300-9400 ft level".)

Cloud is coming up now. It is getting very warm. I am starting
 to back up hill. Everything very quiet.

COMMENT: This morning's observations certainly suggest
 that Alloreganensis can be as conspicuous and highly developed here
 as at the 9200-8800 ft level!!!

10:47. Back up near can. See single Big Bullfinch. 20 ft up
 in VSTF tree. Very noisy. Lots of Whistles. Plus away. Definitely alone.
 Leaving 10:50 am.

NOTE. I have worked along approximately 1 Km of road at both the 9700-9300 ft and 9200-8800 ft levels. These 2 stretches are separated by approximately 1/4 Km. The combined stretches, with intervening gap extend from well above the 30 Km marker to just below the 32 Km marker.

MORE COMMENTS. I have now worked out my figures on both the 9700-9300 ft and 9200-8800 ft levels.

It turns out that the Allogregariousness of the birds of these two areas is quite remarkably similar !!!

This suggests that the birds of the 9700-9300 ft level are "prepared" to "receive" species of the Upper Sub-tropical Zone ("USTZ") — even when the latter are absent.

It also suggests that the Allogregariousness of the birds of the 9200-8800 ft level is, in some sense, "intrinsic." It probably is not purely a reaction to the actual presence of USTZ species (at any given time).

Apparently, the population is somewhat denser at the 9700-9300 ft level than at the 9200-8800 ft. level. Presumably, this is because the vegetation is slightly richer at the higher level (at these particular sites).

There are some indications that a slightly higher proportion of inds. occurs in mixed flocks at 9200-8800 than at 9700-9300. Also flocks may be slightly larger at the lower level. These differences, if real, may be due solely to the presence of USTZ species at the lower level.

Everything seems to be working out beautifully!!!!

March 25, 1966
Atacaso

Going down farther along road below San Juan. Avenue region
8470 ft 5:58. Just starting to get light. Cloud cover.

Dawn Chorus in full swing when we arrive. DC. RP's. All sorts of things. There may also be Diglossine sounds in the general hubbub, but they are rather drowned out.

Certainly, a lot of birds in this area must be in breeding condition.

NOTE: There is rather poor scrub and pasture on one side of the road here, and rather lush forest and scrub on the other side (across ravine).

SEE TODAY'S NOTES ON MIXED DIGLOSSINI

6:47. See single Basileuterus type. Probably magisteratus. Moving thru "hedge" edge pasture. Silent. Definitely alone.

Then see single Atlapetes singing. Definitely rufinucha. 4-5 ft up tree edge pasture. Definitely alone. Then joined by mate. Both birds move off thru "hedge". Lots of ON's and Quettings. Birds ranging 2-6 ft up. Still definitely alone.

6:58. See single B. coronatus. 6-20 ft up mixed forest and scrub across ravine. Apparently alone.

Fog coming in, 7:02 a.m. Go on down to area 8475 ft. Lots of bamboo. Some scrub. Occasional trees. Everything quiet. Fog is beginning to turn into very light rain.

See a single Footy Thrush alone. 7:15. 8390 ft. CORRECTION: This thrush is associating with a definite mixed flock. Other birds include at least 1 Uromyza, 1 Basileuterus or Hemiprocne type, 2 rufinucha, and 1 Plush-capped Finch. All birds very quiet. Moving 2-8 ft up thru mixed-bamboo scrub. Uromyza definitely in lead throughout.

Thrush flies away. Nothing follows. Group as a whole is quite coherent, insofar as almost all birds stick close together. Then ♂ Albi j —
 → group. Disappears almost immediately. Then single Cy j —→
 group. Cy f —→ group repeatedly.

Then group disappears up hill.

Further down road, hear Whitestart singing. NODWAH.

7:40. 8325 ft. See very loose, apparently non-coherent fledge.

Euphonia obviously second growth low scrub. Includes at least 2 Firebellies, 1 Cy, 2 other birds. Sooty Thrush j —→ group. Then Sooty Thrush flies away. Nothing follows.

A little further down road, see single Uruba. Apparently alone a ft up mixed-bamboo scrub edge pasture.

Then see 1 or 2 B. nigrocrinitatus alone a" up bamboo scrub by stream.

7:50. 8275 ft. Region mixed second growth trees and bamboo scrub. See single B. nigrocrinitatus ranging 1-10 ft up. Also pair Whitestarts ranging 8-10 ft up. Also single ♂ Albi, 10 ft up. Also single Haps nucha, 2-4 ft up. Whitestarts and nigrocrinitatus none. All birds about 20-30 ft apart. Then nigrocrinitatus j —→ Whitestart. Then group of 1 ♂ Blackburnian (black and orange, with white on wing), 2 Blue & Blacks, and 2 Firebellies appears. Ranging 10-12 ft up. Blue & Blacks & Blackburnian associating particularly closely. Cy. Blue & Black f —→ Blackburnian. Blackburnian f —→ Blue & Black. Firebellies f —→ group repeatedly. Then the whole assemblage gradually drifts up hill. All species (Whitestart, rufrunus a, etc.), with the possible exception of Albi. Blue & Black - Blackburnian association probably in lead most of time. But group as a whole is not coherent.

Is there a special relationship between Blue & Black and Black
hummer species ??? Very the observations the other day at 9700-9300 ft
level.

NOTE: It is quite remarkable that I have seen only Humid Temp
erature Zone species here today!!!! This must, I think, be correlated with
the fact that most of the original forest here has been destroyed. Apparently
the most characteristic VSTZ species have not been able to adapt to the
scrub which has replaced forest. As a result, they have been replaced by
Humid Temperate Zone species — which are used to scrub in their norm-
al environment.

It would appear that, along this road, the VSTZ species have sur-
vived only higher up, near the border of the Humid Temperate Zone, in what
was once the highest limit of the VSTZ.

Starting back up road 8:17 a.m.

8:21. See single Wronyas in bamboo scrub. Definitely alone
Probably same ind. seen earlier.

8:33. 8350 ft. Group of 5 Wronyas perches rapidly thru mix-
ed bamboo scrub. Definitely alone.

See some more sooty Thrushes alone

Aha! See group 3 or 4 BYB's. Feeding on small berries. See
edge road. 10-20 ft up. Feeding but definitely alone.

8:54. 8345 ft. See single ♀ (!) All. 2 ft up roadside scrub.
Definitely alone.

NOTE: It has just occurred to me that "escorting" of flocks seem-
s to be done only by male Allis here!!!

9:10 a.m. 8500 ft. Region of rock slide, covered with miscellaneous
scrub, between mixed bamboo and VSTF. See mixed flocks. Includes at
least 2 Whitestarts, 2 Flycatchers IV, 1 All. rufous Synalaxis, 3

Firebellies, 2 Plush-capped Tanagers, 1 Blue & Black All quit. All ranging 2-10 ft up. Different inds often are very far apart from one another. At least 100 yds. But all gradually moving up hill at same speed. This is definitely a coherent - if widely scattered - flock. Difficult to tell who, if anyone, is leading. Possibly Flycatchers. At least 1 out of the tree.

Light rain starting again 9:24.

COMMENT: Physically this environment looks perfect for Yellowbellies. And yet they seem to have been replaced by Firebellies throughout the whole of this western range. Why???

NOTE: It is possible that the Plush-capped Tanager completely replaces Blue & Orange at this level. Possibly only because bamboo is so common here.

Litter NOTE: Litter seems to be completely absent here. And yet it does not seem to be replaced by WCC. Why? Too warm here for Litter, and not enough forest left for WCC?

Leaving 9:35 a.m.

COMMENTS: Another thought has just occurred to me.

The very poor development of *Allogregarioum* at Hono and Lloa must be significant.

X The avian faunas must have been in contact with typical humid VSTZ forest (or scrub) at one time. Viz records in Chapman. At which time *Allogregarioum* presumably was highly developed. But now the local faunas have "frontier" only with "grass" (pasture). And they seem to have become adapted to this new situation by losing *Allogregarioum*.

This would suggest that changes in gregariousness occur rather rapidly,!!!!

NOTE: I have been a little cavalier on my use of terms, this morning and on previous days. When I said "VSTZ", I meant VSTZ with more or less "normal" forest and scrub.

SUM TOTAL ALL OBSERVATIONS (1966) = 87 hrs 15 min

Observations in cleared land not suitable
for flocks = 4 hrs 15 min

Time spent in areas which looked
suitable for flocks = 83 hrs 00 min

Time spent in areas where highly
organized flocks actually seen = 62 hrs 45 min

Partial Sumo Central Ecuador

✓ I All areas which look suitable for flocks, 1964 & 1966

$$28 \text{ hrs} + 83 \text{ hrs} = 111 \text{ hrs}$$

$$\text{Inds seen alone} = 239 + 606 = 845$$

$$\text{Inds seen in flocks} = 30 + 453 = 483$$

$$\text{Total no. flocks} = 11 + 78 = 89$$

$$\text{Total no. highly organized flocks} = 0 + 34 = 34$$

$$\text{Largest no. species in flocks} = 10$$

$$\text{Largest no. inds in flocks} = 17$$

$$\text{Total no. species in flocks} = 23 + 278 = 301$$

II ^{which looked suitable for flocks and}
Areas in which highly organized flocks seen (only 1966)

62 hrs 45 min.

$$\text{Inds seen alone} = 606 - 134 = 472$$

$$\text{Inds seen in flocks} = 453 - 16 = 437$$

$$\text{Total no. flocks} = 78 - 5 = 73$$

Total no. highly organized flocks = $34 - 0 = 34$

Largest no. species in flock = 10

Largest no. inds. in flock = 17

Total no. species in flocks = $278 - 11 = 267$

✓ **III** Areas which looked suitable for flocks, but in which highly organized flocks were not seen - 1964 & 1966

48 hrs 15 min

Inds. seen alone = $239 + 134 = 373$

Inds. seen in flocks = $30 + 16 = 46$

Total no. flocks = $11 + 5 = 16$

Total no. highly organized flocks = $0 + 0 = 0$

Largest no. species in flock = 3

Largest no. inds. in flock = 4

Total no. species in flocks = $23 + 11 = 34$

24, 25

III III III 453 Jude in Rocks

[illegible]

Species in flocks

2	2	2	9 8
2	4	2	10 8
3	2	3	2 7
4	3	3	2 4
6	2	2	3 7
2	2	6	3 (06)
2	3	2	2 (10)
3	3	2	2
5	3	3	2
7	2	4	8
2	3	2	2
2	4 (30)	6	2
7	2	2	3
2	4	3	2
5	5	2	4
4	2	9	10 (90)

17 17

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Answers suitable for fleckles

$$\begin{array}{r} 53 \\ 52 \\ 63 \\ 71 \\ 40 \\ \hline 278 \end{array}$$

||||| 34

10 10

(52) 2 3 2 2
(52) (43) (44)

Ecuador

Areas apparently suitable for flocks but
lacking highly organized flocks
All observations 1964 +

Inds Alone

134

Inds in Flocks

|||||

16

Species in Flocks

3

2

2

2

2

11

No. Flocks

|||||

5

No Highly Organized Flocks

0

Largest no Inds in Flocks

4

Largest no. Species in Flocks

3

See Over

All this to be subtracted from observations
in areas suitable for flocks

664
134
530

Hours.

	March 10	2 hrs 00 min
	March 13	3 hrs 45 min
	March 14	3 hrs 45 min
	March 19	3 hrs 15 min
also	March 8	3 hrs 45 min
	March 9	3 hrs 45 min

$1 \frac{1}{2}$
 $1 \frac{1}{2}$ $7 \frac{3}{4}$

20 hrs 15 min.

Central Ecuador

9400-9300 ft below San Juan

March 13, 14, 18, 20, 24

Inds. Alone

(117)

Inds. in Flocks

||||

(124)

Total No. Flocks

|||||

(21)

Spp. in Flocks

3 3

2 2

4 6

10 3 (21)

14

Highly Organized Flocks

||||

(9)

3

2

8

8

2

3 (10)

3

2

3

3

2

2

3

WT = 3.67

3.0

21 777

63

190

170

14

Largest No. Inds. in Flocks

12

(15)

Largest No. Species in Flocks

(10)

Hours

March 13	1 hr 00 min
March 14	3 hrs 15 min
March 18	4 hrs 00 min
March 20	0 hr 45 min
March 24	5 hrs 00 min

14 hrs 00 min

Central Ecuador

9200-8500 ft below San Juan

March 20, 21, 22, 23

Inds Alone

(93)

Inds in Flocks

(125)

Total No. Flocks

|||| | (19)

Highly Organized Flocks

||| (6)

Largest No. Inds in Flocks

117 (117)

Largest No. Species in Flocks

(10)

Sp. in Flocks

4 8

2 29

2 } 96

3 }

2 }

9 }

8 }

2 }

9 }

10 (11)

2

2

2

3

2

2

2

Ar. per flock
4.0

Hours

March 20	2 hrs	15 min
March 21	3 hrs	15 min
March 22	4 hrs	00 min
March 23	5 hrs	00 min

TOTAL 14 hrs 30 min

Southern Peru

February 12, 1964
Machalí Páramo

Going to work around hotel first this morning. Altitude of my room is 8150, according to my altimeter last night.

Rain! Pouring rain!!!

6:05. See a pair of *Thlypopsis* moving thru scrub alone. Sight is very poor, but they look like the Andean birds, i.e. *ruficeps*. Uttering "Secret" Notes and R's.

A second later see a single Orange-bellied Saltator in nearby small tree. Apparently not following the *Thlypopsis*. Sings a little.

6:10. Single Orange-bellied, probably same bird, singing exposed top small bush. More or less "Whit-chit-chincoo" phrases (last note clear and more or less musical whistle). Bird apparently alone.

6:14. Hear what may be Bruen song in distant area. "Twitter", but quite regular, with few or no fluctuations.

Then hear some more, similar song.

See maybe *Thlypopsis* alone. Yellowbills. Probably one of same birds seen earlier.

Then see what looks like a small all-black bird!! Possibly a slaty finch of the *Phrygileus*-type??

Rain getting worse 6:45 a.m.

See a single House Wren alone.

7:12. See another House Wren alone.

7:45 See another Orange-bellied Saltator alone.

Also one of the House Wrens seen earlier. Still alone.

Stop observations 8:10 a.m.

Brown
Brown

Inga second trip out in middle of morning

Heard unmistakable Brown songs 8400 ft 7:15 a.m.

Heard single general Brown, alone, 8500 ft. I think low record for
with sun. Lots of bamboo. Silent

Brown

Rain settling down to a fine drizzle 7:27. Then fog comes in
Hear more Brown songs. All rapid "Tweeters" with little fluctuation

on

Brown

7:30. Come to an area where there are at least 3 Browns singing.

Also hear one or two R-Zz patterns. 8400 ft. Fog too thick to see anything

Brown

Then see a Brown songflight

Then see single Brown (different individual) perched exposed, 6 ft above
ground, singing. Area very low but very thick scrub

Brown

Songs of different individual Browns overlapping a lot.

Then see pair C's alone. Silent. Look quite gray below. Feeding ab-

U

out 50 ft from where Brown sang a few minutes ago

U

Then hear what sound like C's twitters without seeing the birds
at the time

U

A few minutes later and a little further on, hear what may be then,
high Cy "Sweet" Notes and/or Song Notes.

Reach approx 7000 ft 10:20 a.m. Starting down hill

Brown

Come to another area where there seem to be a lot of Browns son-

gong. Browns seem to burst into song whenever fog lifts, a little, temporarily

10:36 a.m. 8550 ft. See a single Cy alone. Eating fruit in tree. Parul

U

ly same type of fruit as one of the ones eaten above Cheekpaysas. Birds silent

Going to try again this afternoon. Rain has stopped. There are even
patches of sun from time to time

Reach 8600 ft 3:00 p.m.

Brown?

What sound like Brown singing 3:05.

4:30. Just below 7100 ft, just over crest of mountain. Very thick wet scrub with lots of low trees. Difficult mixed flock. Includes at least 1 *Acridothera*, 1 *Basileuterus* (possibly with white supercilious, conceivably with rufous crown), 1 *Myioborus* (same species as Hudsoni), & *Geothlypis* possibly more.

Rain starts hard 4:40 pm.

This mixed flock seems to be moving very slowly. Difficult to see. Can't tell who is leading whom. Disappears in a few minutes.

Rain stopped 4:50

Hear what seems to be *Myioborus melanocephalus* song again 5:00

5:15. Sounds as if mixed flock seen earlier were remaining in almost exactly the same place. Can hear *M. melanocephalus* still singing from time to time. And what sound like CN's other species. Unfortunately invisible.

Then see flock. At least 3 birds. Possibly all one species now. Basil euterus types. One of the birds (at least) seems to be the "White stripe" seen near Hudsoni. One of the birds (the same individual?) seems to have white outer tail feathers. All the birds are quite quiet. Just occasional single "CN"s. In thick scrub, 4-10 ft above ground.

This group is very reminiscent of the mixed flocks near Hudsoni insofar as it doesn't seem to be getting anywhere.

Going to start gradually back toward hotel 5:35 pm

W? 5:42. Hear what might be C Twitter. Composed of long series rapid "Dah-de-dah"s. 8700 ft

Brown

6:01. See single Brown singing alone. Song a fast formless Twitter. But not fluctuating.

Arrive back hotel 6:55, without seeing anything more.

NOTES The environment around here is peculiar. The whole slope of the mountain above the hotel, on the same side as the hotel and the ruins, seems very damp. But not covered by as lush vegetation as might be expected. Extensive areas of thick but low scrub. Lots of bamboo. Some sizeable areas largely grass. Arboreal scrub pretty much confined to barrancas. The whole area looks like second growth. But I find it difficult to believe that such a steep slope was ever farmed (without terracing - of which there is no trace away from the ruins). In many places the slope is approximately 75° . And looking at even steeper slopes across the river, I see that they are covered by similar vegetation. So perhaps the (comparative) sparseness of the vegetation on this slope is due to its steepness and nothing else ??? But it is remarkable that the whole of the other side of this mountain, across the crest, seems to be covered with arboreal scrub (as far as I can see - which isn't too far). And at least one other mountain close by seems to have similar contrasts on the corresponding sides - one side with arboreal scrub and the other with low scrub and grass. And on the mountain here, at least, both slopes look equally steep. How can this be explained ???

This morning I certainly saw no traces of mixed flocks. While the rain & fog continued, the birds spent almost all their time hidden - presumably in protected sites under vegetation. Certainly nothing to support the idea that bad weather favors the formation of mixed flocks.

In connection with the hypothesis that mixed flocks may be an adaptation to frontier conditions, it should be noted that the 8000-9000 ft slopes around here go straight down, without interruption by agricultural land, to the scrub along the river valleys. (The RR station is right beside the river and it bears a sign saying that its altitude is 1900 and so

something meters). So the upper slopes here are as near the frontier as they could be. (It might also be noted that this region is quite far to the east, i.e. we are near the eastern border of the temperate zone as a whole.)

A thought has just occurred to me. Are mixed flocks particularly likely to be found where the humid temperate and upper sub-tropical zones merge smoothly into the humid lower sub-tropical and tropical zones ???

In connection with the hypothesis that species in the central Andes tend to be restricted to comparatively narrow, "specialized" niches, it may be significant that I have seen Cyp eating fruit so frequently here & in Chachapoyas. They may be outside the "regular" *Diglossa* niche in these regions.

February 17, 1964
Manabu Pichu

Going to work in same areas again this morning.

SEE TODAY'S NOTES ON MIXED DIGLOSSINI

Coming back toward hotel 8:30 a.m., 8500 ft. Come across a pair of W II, the "unknown tanager" species. Very similar to, or identical with, the Andean bird(s). Looking somewhat grayer above, but this is probably an effect of the rain. Today I notice that the sides of the neck (and head?) are chestnut like the underparts. Also that the bill is flesh-like (could there be "flesh-capped finches" ???). The two birds were silent and alone. In area of low, thick scrub. Bamboo with a few other things scattered about.

I must keep my eye out for this species. It may be a good example of a species that is gregarious (forming mixed flocks) near the southern

border of the humid temperate Andean region but not near the center.

Incidentally, speaking of "frontiers"..... I think that mixed flocks are surprisingly rare here, considering how close to the eastern frontier of the climatic region we are here - and how close there are patches of warmer climate, vegetation, etc. Mixed flocks seem to be peculiarly characteristic of only the northern and southern frontiers of the humid temperate zone (i.e. where there is actually frontier on all 3 sides), not the eastern and western frontiers (alone).

This afternoon going to start working near hotel 2:30 p.m.
Rain has stopped and fog is partly lifted.

2:58 p.m. See a single cyanocephala alone. Slightly below hotel.
In rather uneven scrub of moderate height, on the average.

3:55 p.m. See single House Wren alone near ruins.
Then there is rain. Which stops 4:30 p.m.

4:35. See a single Thlypterus alone. Definitely ruficeps. (I shall just call this species "Orange-heads" from now on.) Slightly below hotel. Area of thick low-scrub.

5:15. See single cyanocephala alone. Possibly same bird seen earlier this afternoon. In small tree 6 ft above ground. Silent.

5:28. Just below hotel level. See a pair of the peculiar fresh or tanager. I (I shall call them "Gold caps" from now on. Moving thru low bamboo thicket. About 2-3 ft above ground. Silent. Definitely alone.

Then see single cyanocephala alone again. Low thick scrub.
Possible connection. About 20 ft behind the cyanocephala is at least 1 Basil euternis type. Either young magisteratus or (more probably) lutoviridis. Definitely olive crown, but crown slightly darker (perhaps blackish) at edge of yellow supercilioses. Warbler may be following tanager. A minute later,

✓
catch a very brief glimpse of a single CC about 30-40 ft behind warbler.
Don't know if it is associating with the latter or not.

5:45. Catch good view of what may be same warbler(s). A pair together now. Crown definitely olive (i.e. definitely not nigrocapitata). Yellow supercilium, quite broad, but seems to end fairly abruptly behind eye. Legs flesh colored - fairly bright, almost coral. One or both birds very vocal. Uttering lots of thin but hoarse, rather loud, urgent sounding "seee seeee seee seee seee seee seee"

Notes. Also occasional brief R's (hardly more than "Bump"s). In low scrub, also landing on grass verge of road. At this time, these warblers are not accompanied by or accompanying either yanocapitata or CC. But they are associated with one Orange head. Close together. Orange head apparently silent. At least once, warbler f → Orange head.

These warblers were so vocal that I am inclined to think they must have been adults (?). Appeared to be approximately same size as the Orange head. If I remember museum specimens correctly, this would indicate that they are Bauleuterus, not Hemipungus. (Their bill appeared to be moderately long - probably not too long for Bauleuterus.)

Stopping observations 6:00 pm.

Why are there no Firebellies or Atlapetes around here? Joe

met 200

February 18, 1964
Mackenzie Prescher

Walking about hotel, in same places as yesterday morning.
SEE TODAY'S NOTES ON MIXED DIGLOSSINI

③
That usual mixed flock just over crest of ridge.

For a long time, remains just out of sight down hill. Apparently not making much progress. Sounds diffuse. Obviously contains Ag's at least occasionally, whistlers (s), and others.

Ca. 7:30 a.m. Catch brief glimpse of what is either advance guard or flanking party of the flock. In thick trees, 10-20 ft above ground. Two Catmonia-type finches (LXII); one unknown type, possibly furnarid (LXIII), and one Ocellular-type flycatcher. They take our look at me and retreat down hill.

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first), and quite close together. Flock as a whole much more coherent and purposeful than usual. I think that this was because they had run up against the path, were following it uphill, and then (almost all of them) chose to cross the path at the same point.

W When the Cys ran up against the path, they did not cross it where the others did (later). They crossed it by flying diagonally down hill. And all the other birds went down hill in the same direction as the Cys after crossing.

I think that the nucleus of this flock can be considered "semi-permanent"!

8:15 a.m. Catch brief glimpse of Atlapetes schistaceus - like bird in scrub, where the flock was earlier but is no longer. Rufous crown. Quite dark medium gray below, blackish above. Didn't notice mount above stupes.

ADDITION: All the birds in the flock observed 7:50 ranged thru many layers of scrub, from approximately 3 to 20 ft above ground. The Cys and the whistlers probably stayed higher, on the average, than the others.

NOTE: It is beginning to look as if there is one "ideal color pattern" for members of mixed flocks in the southern Andes. Gray blue above, and buffy to chestnut below.

Going to go a different way this afternoon. Along a path which I think will lead to Huayna Picchu eventually. Starting out 3:05 p.m. Sun shining, of all things!

Nothing! 4:30 p.m. I suppose the little darlings are too hot!

4:35. See pair of Black & Blue Chazgers in trees on very steep slope. Definitely alone. This area is 8150 ft according to my altimeter now. Vegetation on rocks "virgen" Short old twisted trees. Lots of moss.

6:05 p.m. Right down birds near. See a pair of Cyanocephalus alone.
In virgin cooling scrub. Altitude 7875 ft
Cyanocephalus & here are certainly not obligate commensals!!

February 17, 1964
Machhu Pichu

Lots of fog this morning. Going to work around base of
Huayna Pichu, near ruins of Machhu Pichu itself.

Dawn chorus starting 5:40 a.m. No Diglossini sounds
Peculiar. This whole area, ca 7800-7900 ft seems to be quite lacking
in Diglossini. Part of the vegetation looks second growth (bamboo, etc.),
part looks "virgin".

June 77?

See single Cyanocephalus alone 6:10 a.m.

6:25. Hear something which sounds like brief snatches of Lafresnayi
sip song. Part way up slopes Huayna Pichu 7900 ft.

6:40 See a pair of Black & Blue Tanagers same place as yesterday of
tomorrow. At first alone, except for some Elaenia & Contopus-type flycatchers,
with whom they do not seem to react. Then associated with a pair of something
else, possibly Cyanocephalus. Then disappear.

A few minutes later, in low scrub under trees, see a single Atlapetes
of a new type. Yellow below, black above, yellow crown (slightly brighter
than underparts, slightly orange-ish on forehead. No wing-patch.
Apparently alone. Uttering "CN"s.

This species quite reminiscent of "PR". It is no. LXVI. I shall
call it "Yellow crown Atlapetes".

All this is at 8000 ft. A relatively large (for this mountain) pair

lots of very mixed scrub. Some cacti old, some new. Some trees, some low areas

W 14:05. 8075 ft. Region rather sparse scrub. Hear 2 unmistakable Cy songs, without seeing the individual uttering them. Then hear a few more songs a few minutes later. No R components

Reach Ina River on top mountain 7:40 am. 8450 ft. Starting down again.

W 7:55. High by under 8400 ft. Hear another Cy singing. "Ta ta ta ta zeau zeau zeau" type phrases

W Possibly Cys are breeding in this region. They certainly seem to be more widely distributed than any of the other local diglossines

W Cy songs right there. Hear Wren song. See single Horn Wren alone.

SEE ALSO TODAY'S NOTES ON MIXED DIGLOSSINI

Raining in the afternoon. Also fog coming up. Going to try working just below hotel.

4:50. Come across pair of Basileuterus luteoviridis types same place as a couple of days ago. One or both still uttering hoarse "seee" Notes. Is it FB? Also occasional brief R's. Definitely alone until 5:08.

Barn! 5:18. Hear what sound like Barn R's. See bird in silhouette in bad light. Might well be Diglossa. But color looks wrong. Appears grayish underneath.

See a single Orange bird alone.

W 5:58. See a pair of C's. Gt first with another bird (unidentified) nearby. Then C's fly away. Other bird does not follow. C's utter several "Twitter" as "greeting" when landing together. 7400 ft.

Ending observations 6:15 p.m.

February 20, 1964
Martin Pecher

Heavy fog and rain 5:20 a.m. Going to try working near hotel and road leading down hill — but without much hope of getting results

6:14 See pair of Orange-heads alone. In garden-like area of fairly tall but scattered bushes right in front of hotel. Alone at first. Then joined by single House Wren. No reaction between the 2 species. House Wren flies away. Orange-heads do not follow. This mixed flock obviously purely "coincidental".

6:20 Rain stopped, but fog still very thick.

Going down road with glimpses of several House Wrens apparently alone

Give up 7:40 a.m.

8:50 a.m. Hear Cy singing outside my room. In several phrases.

Then resume operations, as fog seems to be lifting.

9:00 See a single cyanocephala alone. In thick low scrub.

9:25 See a single Orange-bill alone

9:35 Hear Bani-like songs coming from same area as yesterday afternoon. Again can't see the bird. Rain & fog again!

NOTE: I am told that the wet season here is December-March. The real dry season is April-August

Going to try again 10:05 a.m.

Rain starts again.

Get back to my room 10:30. Hear Cy singing for a long time. Phr

are after pleasure, with only the barest games between

Working same area after lunch

2:15 - 2:45 Catch several more glimpses of a Basileuterus luteoviridis type. Still uttering hoarse "seee" Notes & brief R's. This bird certainly seems to be more vocal than the luteoviridis-types near Anduave. Is it the same species???

Then get another glimpse. Actually two birds. Quite alone

SEE ALSO TODAY'S NOTES ON MIXED DIGLOSSINI

February 21, 1964
Machin, Puelin

Going to work above Machin Puelin this morning. Not the road that goes to the west of the ridge. The one that is supposed to go to the peak of Machin Puelin mountain. Some fog. Otherwise clear.

Brown

Near first presumed Brown song 5:30 a.m. Area dense low scrub 7950 ft. Songs are Twitterers. Rather fluctuating

7 CORRECTION: At least some of these Brown-like songs are being uttered by a small grayish bird. (C ????)

Brown

Silent

See a single ♀ or juv. Bari alone 8150 ft. Region thick low scrub.

ck
Bari

Probable overlap C and Bari territories or home ranges.

Diglossini songs much less frequent 5:58 a.m.

SEE ALSO TODAY'S NOTES ON MIXED DIGLOSSINI

6:40 8550 ft. See single fairly EXT alone. In low scrub

ck

7:00 a.m. 8800 ft. Region of thick low mound growth. Nearly

singing. Also what sounds like whistling up hill. No overlap.

NOTE: In summing up, all I can say about mixed flocks is that they seem to be relatively rare at relatively low elevations here. The few mixed flocks seen at relatively low elevations may also be transitory and relatively loosely organized. There are at least some highly organized flocks ca 7000 ft and slightly above. One flock quite reminiscent of Hudsonian flocks 10,000 - 11,000 ft. Are birds at 7000 ft here more gregarious than birds at same elevation near Hudson? If so, is this significant? Are the different faunal levels just lower here than near Hudson ???

Perhaps the most specialized inter-specific relation here is

(W) cyanocephala - Cy

Washou Beach Feb. 16, 1964

Crest and E side 1964

No. Inds. seen alone

III 1 (a)

No. Inds. in flocks

(25) III III III III III

No. flocks seen

III (3)

No. spp. per flock

4

4

9

No. H. O. flocks seen

III (3)

(17)

Largest No. Inds. One flock

14

Largest No. spp. One flock

9

Mashu Pucku Feb 16, 17, 18, 19, 20, 21

All other areas 1964

No. Inds. Seen Alone

|||||
||||| (6)

No. Inds. in Flocks

||||| (20)

TOTAL = 26

23.26%

No. Flocks Seen

||| (6)

No. Spp. Per Flock

3

2

No. H.O. Flocks Seen

||| (3)

2

2

2

Largest No. Inds. One Flock

4

4

(19)

Largest No. Spp. One Flock

4

Wachan Piesher 1904

Hours - Crest and East Side

Feb. 16. 1 hr 00 min

Feb. 17 0 hrs 15 min

Feb. 18 1 hr 45 min

Feb. 19

Feb. 20

Feb. 21

3 hrs 00 min

March Packer 1964

Hours - All other areas

Feb. 16 2 hrs 00 min

2 hrs 00 min

1 hr 30 min

1 hr 00 min

Feb. 17

1 hr 00 min

0 hrs 30 min 1 hr

3 hrs 15 min

Feb. 18

1 hr 00 min

1 hr 00 min

3 hrs 00 min

Feb. 19

3 hrs 00 min

1 hr 15 min

Feb. 20

0 hrs 30 min 1 hr

2 hrs 00 min

0 hrs 45 min

Feb. 21

3 hrs 45 min 1 hr 30 min

24 hrs

3 hrs 30 min

TOTAL = 27 hrs 30 min.

Southern Peru

February 22, 1964
Mr. Cuzco

Walking below Pisco this morning. Area where I fell in river last y
ear! Path begins at 9400 ft according to my altimeter now. Arrive 5:50 a.m.
Already light

See single Orange bell alone.

6:10. See a very big rosy thrush. Alone. Orange bell & legs. No bright
eye ring.

Brown 6:14. See what appears to be juvenile Brown. In narrow scrub along
irrigation ditch. Possibly not alone

Another single Orange-bell. And another.

Brown? Have heard a few songs which might be Brown. Rapid, regular, non-
fluctuating Twitters

6:55. Another single thrush alone. Apparently same species

Quite a lot of Agave in flower near here. Don't see or hear any Bayers,
however

CC Not far away see pair of CC's in hedge. Utter long very rapid Twitters as
"Greetings" Fly into tree next to agave, but apparently not into agave itself.

Brown 7:15. Slightly different area. See single Brown singing alone. Each song
phrase rapid twitter. ~~Not~~ very fluctuating. Descending "eyoo" at end. Phrases
much shorter and appreciably less rapid than CC "Greetings" twitters. This Brown
sings quite a lot of phrases one after the other. Intervening pauses of variable
length. Saw very thick and rather moist-looking hedges here. Brown in one he-
dge, 10-15 ft above ground

CC CC's here are definitely very gray underneath here - except for under tail
& coverts

9600 ft. Going up stream. Come to area where there are lots of tubular red flowers. Some with holes in corollas. Also some pink trumpet shaped flowers. But no nectar or available diglossines.

Incidentally, this looks like very good area for Myiophobus. I wonder why there aren't any. Surroundings outside stream area too dry?

NOTE: Stream Area is more flooded than when I was here last year.

Brown 8:05. See single Brown feeding (on insects?) alone in drier scrub along edge ravine.

There is a small hummingbird visiting tubular red flowers by stream itself. Could this bird be making the holes ???

GC Near what may be GC in distance.

Starting down hill 8:15 a.m.

See a single House Wren alone

Brown 8:34. See another single Brown. Silent. Alone. Again in drier scrub toward edge of ravine.

8:50. Down almost to road level again. See another single Orange-bell alone.

Then see bright bonariensis. At first has dull bird, (which I think is P. gagei) with him. Then the latter disappears. Bright bonariensis perches in Eucalypt. Utters lots of TW phrases. "Wheet chu wheet chu wheet chu which"

Brown After a minute or so, the sound of these phrases seems to stimulate an (unseen) presumed Brown, about 50 ft away. It also begins to sing. Twitterers. Sometimes phrases of 2 species overlap; sometimes they alternate! Then the bonariensis shut up. And the presumed Brown does too!

Brown It looked as if this Brown were "put up", desperate to react with something vocally. Probably not getting enough vocal stimulation from other diglossines in this area now.

Stopping observations 9:00 a.m.

The situation here this morning certainly appeared to be much the same as last year.

Would also seem to confirm my impression that the fauna of the central - south central Andean area is highly impoverished. Some of the areas visited this morning appeared to be perfectly suitable for *Troglodytes* and/or *Atelaptes* sp. Also *Baileutherus*-types. (And very common above & *Thlypops* above.) Certainly the region as a whole is not too wet!

This afternoon going to work along road parallel to RR to Machu Picchu. Reach barranca 11,625 ft. Some scrub. And then rain starts heavily! Lets up a little 3:25 p.m. Going to get out and take a look

3:36. See a single *Colibri coruscans* alone.

Eucalyptus trees (apparently same species as at Gento) are in bloom here. Also where I worked this morning. But nothing seems to be using them but humming birds.

No sooner said than done. Something uttering loud Twitters in Eucalypt sounds like *Brun*. Quite a lot of phrases in fairly rapid succession.

Then see single *Brun* feeding on Eucalypt flowers for minutes on end. Looks rather dull. May be juvenile. Silent except for "CN"s while feeding.

Further on, see adult *Brun* in Eucalypt, 40 ft above ground.

Then presumably same bird sings quite a lot in distance.

Then see same or another *Brun* in tree again.

Brun (s) ignoring Black-headed Goldfinches same tree.

See single *Brun* fly by. Lands high in Eucalypt. Utters one Twitter.

Stops. As soon as it stops, a single *C* in dry scrub uphill utters one brief Twitter. No overlap. But it certainly looks as if the *C* were stimulated to sing by the sound of *Brun* song. *C*'s shuts up. *Brun* utters occasional Twitters &

1000
during the next 3 minutes. C remains quite silent. Then Brown starts up.
4:20 pm. Presumed Brown sings again from time to time. No other
diglossini visible or audible.

CORRECTION? I think that this presumed Brown starts up, and
probably moves into another tree, whenever a pair of Black-headed Goldfinches
(♂ & ♀) flies into the tree in which he is singing!!!

Leaving 4:40. Everything quiet.

NOTE: I don't think that I worked in this area last year.

On my way out, see Brown fly out of small bush-like tree along stream.
Quite alone.

This Brown was certainly surprisingly vocal this afternoon. Coming
in (or out) of breeding condition?

Going to work in another area, 11,750 ft. Arrive 4:55 pm.

Lots of Eucalypts around here. Some scrub underneath the trees.
See a single Orange-bell alone.

See a single Colibri coruscans alone.

Ending observations 5:30 pm.

February 23, 1964
Mr. Cuzco

Going to work same place this morning as yesterday morning.
SEE TODAY'S NOTES ON MIXED DIGLOSSINI.